

Taylor Wimpey

REMEDIATION STATEMENT

(Contamination Proposals)

for

Henthorn Road, Clitheroe

October 2012

REPORT No: 12TAY0011/RS

- *Phase 1 Desk Studies and Site Walkovers*
- *Phase 2 Intrusive Contaminated Land Investigations*
- *Geotechnical Appraisals and Ground Investigations*
- *Landfill Gas Assessments and Remedial Design*
- *Remediation Design and Implementation*
- *Remediation Project Management and Supervision*
- *Site Abnormal Assessments (Foundations and contaminated land)*
- *Ecological Surveys (Bats, Badgers, Newts, Japanese Knotweed etc)*

GEOTECHNICAL - CONTAMINATED LAND - ECOLOGY - FLOOD RISK

DOCUMENT ISSUE RECORD

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TABLE OF CONTENTS

1. INTRODUCTION	4
1.1 The Commission and Brief.....	4
1.2 The Proposed Development	5
2 BACKGROUND	6
2.1 Site Description.....	6
2.2 Site History.....	7
2.3 Ground Investigation.....	9
2.4 Proposed Remedial Actions.....	12
3 REMEDIATION STATEMENT	14
3.1 Aims	14
3.2 Remediation Scope.....	14
3.3 Remedial Methodology	15
4 REMEDIAL WORKS (SPECIFIC OBJECTIVES)	18
4.1 Demolition & Site Clearance	18
4.2 Excavation of Hardstanding and Foundations	18
4.3 Processing of Arisings	18
4.4 Construction.....	18
4.5 Dust, Vapour & Odour Control	18
4.6 Export to Landfill	20
4.7 Backfill of Excavations	21
4.8 Cut and Fill / Regrade	21
4.10 Boundary Issues	21
4.11 Highways	21
4.12 Control of Water.....	21
4.13 Selection and Placement of Cover Materials	22
5 METHODOLOGY/PROGRAMME.....	23
5.1 Imported Soil.....	23
5.2 Contingency for Unknown.....	24
5.4 Site Certification.....	24
5.5 Programme of Remedial Actions (Implementation Timetable)	25

APPENDICES

Appendix A – Drawings

Drawing No.	Title
	Proposed Layout
	Cut and Fill drawing - Awaited

Appendix B – Third Party Reports

Report Ref:	Title
KB450-03/AES/HB/GP	PHASE 1 DESK STUDY REPORT For LAND OFF HENTHORN ROAD, CLITHEROE, LANCASHIRE 9 June 2010 Gladman Developments Limited Johnson Poole and Bloomer Limited (JPB)
J-D0968.00_R1_NLH	GEO-ENVIRONMENTAL INVESTIGATION REPORT For GLADMAN DEVELOPMENTS LIMITED On a site at HENTHORN ROAD, CLITHEROE dated 28 May 2012 Job No: J-D0968.00 by Opus Doncaster

1. INTRODUCTION

1.1 The Commission and Brief

Betts Geo Environmental (Betts) have been commissioned by Taylor Wimpey to prepare a Remediation Statement for the remediation and preparatory works of land adjacent to Henthorn Road, Clitheroe to enable release of Outline Planning Permission Conditions as detailed below.

'Development shall not commence on any phase approved under condition 9) of this permission until that phase has been subject to a detailed scheme for investigation and recording of contamination of the land and risks to the development, its future uses and surrounding environment. A detailed written report on the findings including proposals and a programme for the remediation of any contaminated areas and protective measures to be incorporated into the buildings shall be submitted to and approved in writing by the Local Planning Authority. The scheme shall include proposals for the disposal of surface water during remediation. The remediation works shall be carried out and a validation report shall be submitted to and approved in writing by the Local Planning Authority in accordance with the approved proposals and programme. If during the course of the development further evidence of any type relating to other contamination is revealed, work at the location will cease until such contamination is investigated and remediation measures, approved in writing by the Local Planning Authority have been implemented.'

The remediation statement has been based upon previous phases of ground investigation, the reports reviewed and referenced within this report are listed below:

- PHASE 1 DESK STUDY REPORT For LAND OFF HENTHORN ROAD, CLITHEROE, LANCASHIRE 9 June 2010 ref KB450-03/AES/HB/GP Gladman Developments Limited Johnson Poole and Bloomer Limited (JPB)
- GEO-ENVIRONMENTAL INVESTIGATION REPORT For GLADMAN DEVELOPMENTS LIMITED On a site at HENTHORN ROAD, CLITHEROE dated 28 May 2012 Job No: J-D0968.00 Report Ref: J-D0968.00_R1_NLH by Opus Doncaster
- Phase 2 Supplementary Ground Investigations undertaken by Betts Geo Environmental June 2012 (data incorporated into this remedial statement)

Whilst Betts Geo Environmental Ltd cannot be held liable for the third party, client furnished, results/data, it is suggested that it is reasonable to assume that the data provided in these reports have been undertaken with suitable care and due diligence by suitably experience consultants. As such the data is regarded as being of an appropriate standard to utilise within this report.

This report should be read in conjunction with the third party reports, where technical detail is required.

1.2 The Proposed Development

The proposed development at time of issue is anticipated to comprise two storey private residential houses with associated hardstanding and domestic gardens.

This Preliminary Remediation Statement has been prepared for the purpose of demonstrating to the Local Planning Authority the level of professional reporting/risk assessment.

Betts reserves the right to amend this remedial statement in the light of further information, such as site observations and unforeseen conditions.

2 Background

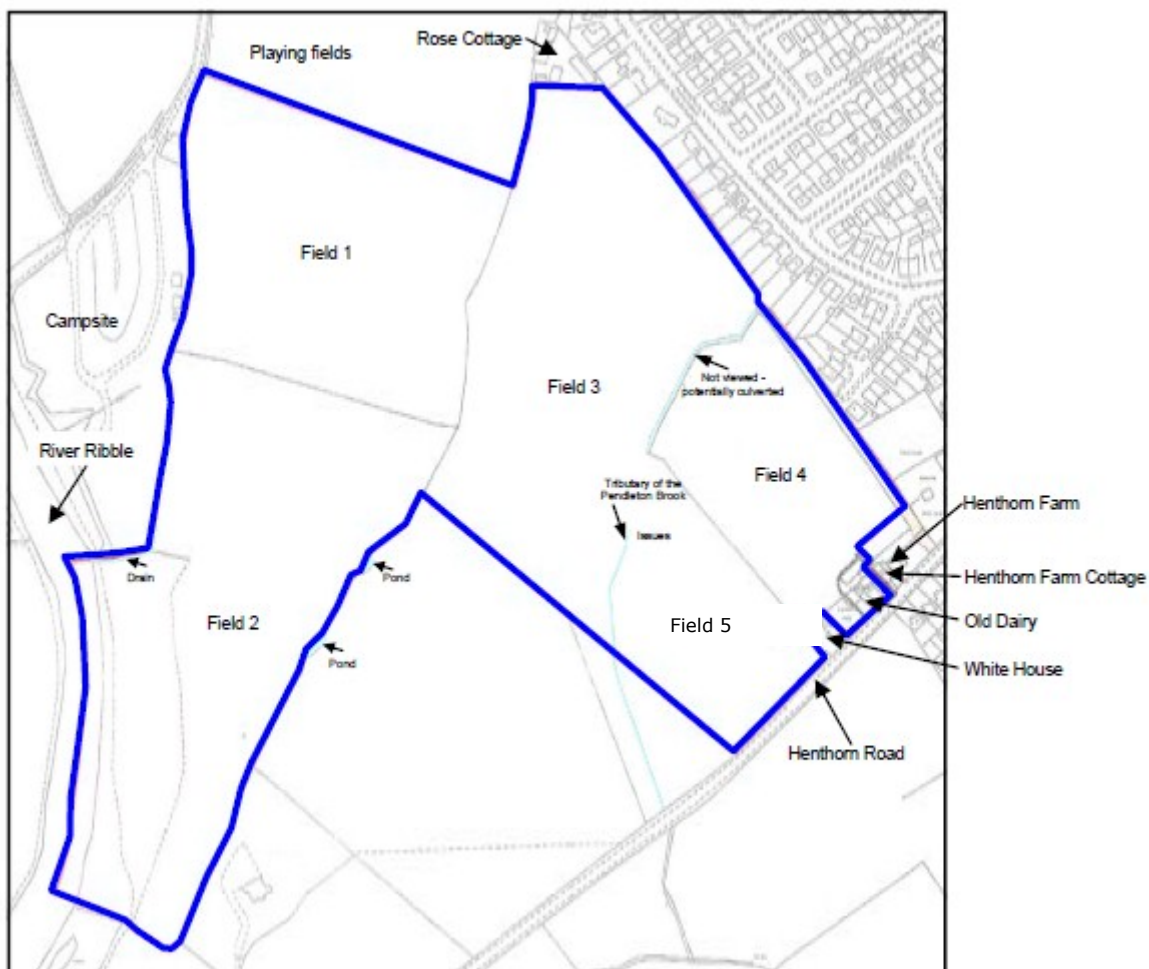
2.1 Site Description

The site is situated off Henthorn Road, Clitheroe, centred on approximate National Grid Reference 373200, 440943

A site walkover was undertaken by a Betts engineer on 12th June 2012.

The site is irregular shaped and topographically generally undulating with a steep valley central where a watercourse is evident and steeply sloping in the north where the field drop to the nearby river channel. The site comprises several agricultural fields or pasture divided by hedgerows predominantly comprising hawthorn with occasional mature trees.

For ease of reporting the same description for the fields in the JPB reports has been adopted divided into five fields numbered 1 to 5, as shown below



Field 1 forms the south western area of the site. The field is roughly triangular in shape, the field slopes steeply west towards the River Ribble. The field is accessed via a gated area from Field 3.

Field 2 forms the north western area of the site. The field is broadly square in shape and gently

slopes towards the western boundary. Two access gateways were located in the field, one in the south eastern corner leading to field 1, and a second in the north eastern corner leading to Field 3.

Field 3 formed the central part of the site and was roughly rectangular in shape. The field was generally flat, sloping very gently towards the north east. A circular depression, with a diameter of approximately 18m and a depth of 1.5m, was located in the north-east of the field. The field has five access gateways, one in the north west leading to Field 2, one in the south west leading to Field 1, one in the north east leading to Field 4 and two in the centre of the eastern boundary leading to Field 4 and 5.

Field 4 is located to the north east of the site, the boundaries of which comprise the rear garden areas of properties fronting onto Fairfield Close to the north and Henthorn Road to the east. The field is accessed in the northwest and southwest from Field 3 and via land present adjacent to the southern boundary of 'The Old Dairy' on the eastern boundary of the site, off Henthorn Road.

Field 5 is irregular in shape and located in the south east of the site, access to the field is gained via a gate in the north east, onto Henthorn Road and to the north west to Field 3. The field is relatively flat starting to slope quickly towards the west and south west towards a small stream.

The site boundaries comprise open farmland with the exception of east and far south east where existing residential properties exist and football pitches to the far northern boundary.

A culvert is note running along the south east boundary of field 3, turning into an open watercourse to the south west.

2.2 Site History

A review of the historic maps obtained as part of the JPB report has been undertaken, the review is summarised below:

On site

'The 1884 map shows the site and its surroundings to have been predominantly fields, divided by tree lined field boundaries. A watercourse is shown to have trended north to south in the east of the site and a pond was located on the 'v' shaped southern site boundary. The River Ribble is also shown to have trended north to south in the southwest of the site with a footpath running within the site boundary.

Henthorn Road is already constructed on the earliest plan reviewed and is present to the southeast of the site, with buildings shown along it annotated as 'Henthorn Villa'. A track is noted to have trended from Henthorn Road in the far southeast of the site, along the northeast site boundary, to a feature that is annotated as 'old quarry'.

No changes are noted on site until 1910 where a small building is shown to have been constructed centrally along the western site boundary. This building is only shown between 1910 and 1912 and is likely to have been agricultural in nature.

A second pond is annotated along the 'v' shaped southern boundary on the 1932 plan and a land drain is shown to feed into the River Ribble in the far west of the site. These features still remain present today.

'Henthorn Villa' is first shown as 'Henthorn Farm' on the 1964 map. No further significant changes are noted on site from this time to present day.'

The Old Dairy was mentioned in the JPB reports but not within the context of historical setting. A review of the available maps show the former dairy as being part of Henthorn Farm.

Old Quarry is evident on the first edition maps in the north east corner of site, which is still present current day. On the 1950's maps a spring is noted within the quarry

Off Site

'The site was situated predominantly within open fields throughout the first part of the 1900s. The main features of note, from the late 1800s to the mid 1900s, are Rose Cottage which was situated immediately north of the site and Siddows Hall, located immediately south of the site. Further afield the Lancashire & Yorkshire Railway Line (Bolton, Blackburn & Hellifield) is shown to have trended from the northeast to the south approximately 450m east of the site, with the town of Clitheroe trending north-easterly beyond. Filter beds are shown to have been located approximately 350m south of the site and a Sewage Farm (Clitheroe Corporation) is shown to have extended from approximately 500m away.

The 1930 map shows a refuse destructor to have been located approximately 400m south of the site. By the early 1970s the Sewage Farm is shown as a Sewage Works with various tanks present and the refuse destructor is no longer annotated. The 2002 map annotates a Household Waste Disposal Centre and landfill site to have been present from approximately 400m south of the site, in the vicinity of the former refuse destructor and Sewage Works.

From the mid 1950s, residential development is shown to have commenced northeast of the site, with the development shown as present day by the 2002 plan edition.

Recreation ground is shown immediately north and northwest of the site in the 1970s, which is, in part, developed as a caravan site and miniature railway (west of site) by 2002. No further significant changes are noted.'

2.3 Ground Investigation

Previous Investigation undertaken in May 2012 by JPB comprised

- Nineteen trial pits (TP1 to TP19),
- Five shallow CBR trial pits (CBR1-CBR5),
- Nine window sample holes (WS1, WS2a, WS2b WS3-WS8)

In addition a further 12 confirmatory trial pits were undertaken by Betts Geo (TP101 to 112) on the 12th of June 2012

A summary of the JPB investigation findings are presented below:

2.3.1 Ground Conditions

Published Geology

The documented geology of the site is summarised on British Geological Survey Map 63 principally:

Drift	Solid
Devensian Glacial Till (clay with gravel and occasional layers of sand.)	Clitheroe Limestone Formation and Hodder Mudstone Formation (Undifferentiated).

The underlying geology encountered in previous investigations is summarised below.

Made ground was encountered at five locations in the east of the site (CBR4, CBR5, CBR6, TP19 and WS4). The made ground encountered generally comprised topsoil with a small proportion of gravel sized fragments of brick, sandstone, timber, concrete blocks and metal.

Brown, clayey topsoil with rootlets was encountered in all machine excavated trial pits and window sample boreholes to an average depth of 0.25m below existing ground level (begl).

Underlying the topsoil weathered Glacial Till Deposits were recovered as orange grey mottled, slightly gravelly clay. This was recorded to a maximum depth of 6.0m (begl) in WS6. Silty clay was encountered in a number of exploratory holes but was proven in WS1 from 2.90 to 8.0m (begl).

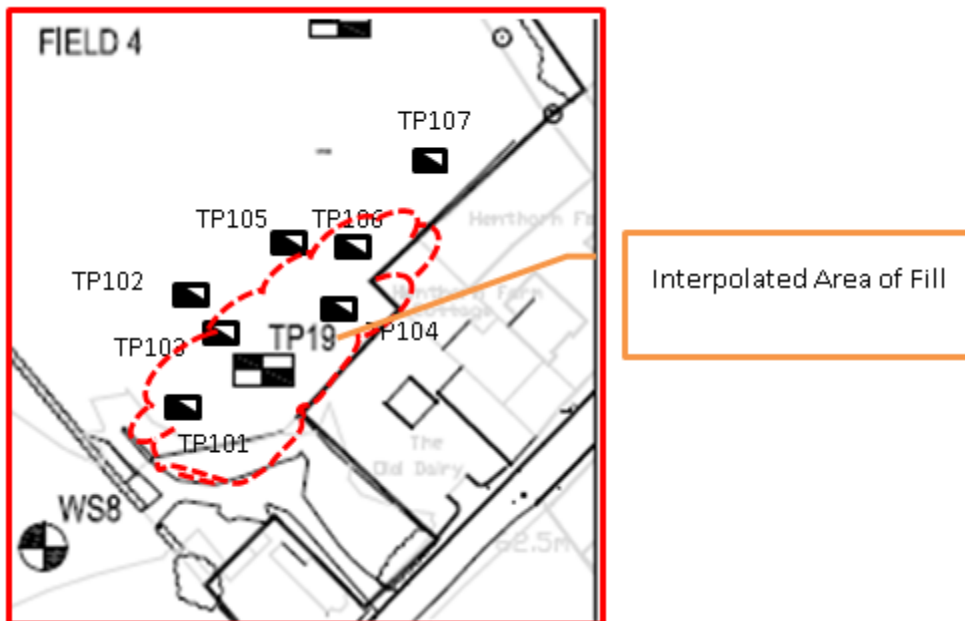
The findings correlate with those conditions identified in the Betts trial pits with the exception of tarmac arising found in the made ground in the vicinity of TP19 and coal fragments found in trial pits within field 5.

The area of made ground around TP19 was proven to be the most significant and additional trial pitting to delineate the extent of made ground was required. Betts Geo undertook this additional testing as detailed below.

Extent of made ground around TP19 (behind former dairy)

Additional pitting was extended across this area radiating out from the former TP19.

Made ground extended to 1.7m in TP19 – and within the area extended to 1.3m and relatively well delineated the extent (see sketch below)



The fill within these additional trial holes were typical of general demolition material as per the JPB report, with the addition of tarmac road planning's in places.

Groundwater Observations

No significant groundwater seepages were encountered during the investigations, however groundwater was recorded within some of the ground gas/water monitoring installations during subsequent monitoring.

Contamination

Generally no positive determinants were encountered when screened against residential with plant uptake.

Made Ground

Metals

No elevated occurrences of metals were encountered exceeding the residential with home grown produce guidance. No further risk analysis required.

Total Petroleum Hydrocarbons (TPH)

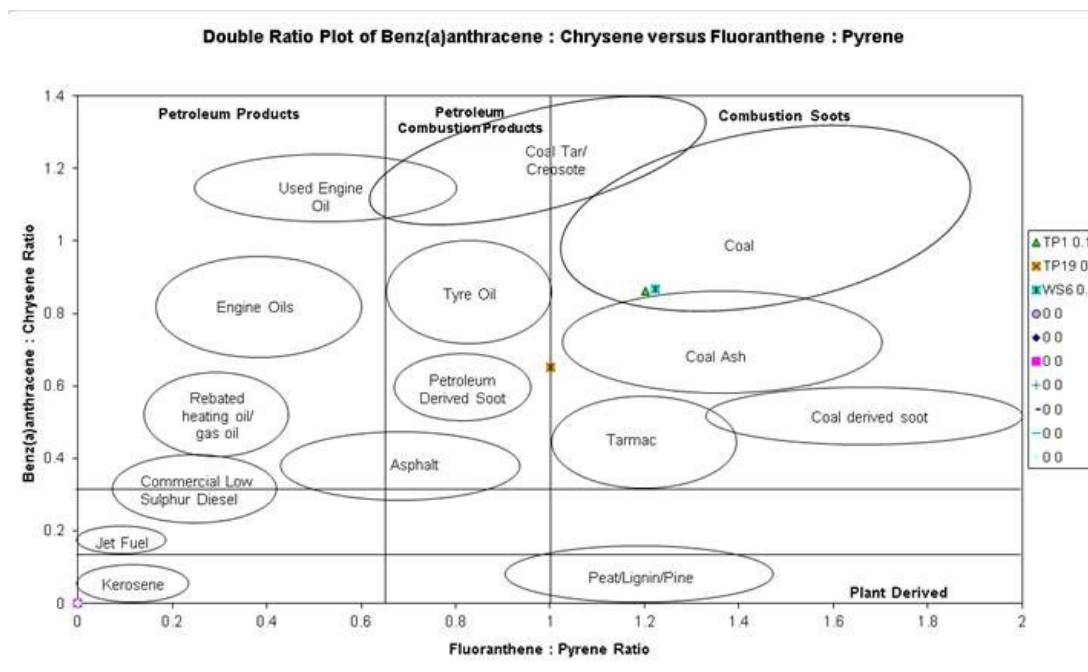
No elevated occurrences of metals were encountered exceeding the residential with home grown produce guidance. No further risk analysis required.

Polycyclic Aromatic Hydrocarbons (PAHs)

Generally no elevated occurrences of PAH were encountered exceeding the residential with home grown produce guidance, as anticipated from previous usage.

The exception to this is PAH's in field 5 and to the rear of the former dairy (TP19)

Samples taken were 'fingerprinted' using double ratio plots (see below)



TP19 correlates with the tarmac found in the Betts trial pits. Allowance for 600mm of clean cover for garden in this locality should be made.

Trial pits we undertook in Field 5 found coal fragments / gravel of coal in the natural drift – again correlating with the fingerprint.

As such a cover system isn't required at this locality based on its origins lessening the risk, however due to the anticipated clean clay and topsoil surplus on site a 'swap of soils' using this 'coal impregnated' material could be undertaken for areas of proposed public open space where ingestion is a significantly lessened risk.

Natural Strata

No elevated determinants were identified within natural strata against residential with home grown produce guidance levels. No further risk analysis required.

2.3.2 Ground Gas Conditions

No significant risk of ground gas has been identified within the JPB desk study and ground investigation.

Green Gas protection measures are deemed appropriate.

2.4 Proposed Remedial Actions

The following section details any recommendations to reduce risk on site and recommended remedial actions. For clarity the section has been divided into potential receptors detailed in the Final Site Conceptual Model.

2.4.1 Site end users

The site is chemically suitable for its intended end use with the exception of the topsoil in the vicinity of field 5 and land adjacent to the former old of dairy in field 4

Imported Soils

It is unlikely that imported soils being brought to site, however if required they should be tested for contamination to ensure that they are suitable for the proposed use, and it is generally advisable to test a minimum of three samples, or one sample per 150m³ so that a representative mean value can be calculated. .

2.4.2 Construction/Maintenance Workers

In order to reduce potential risks associated with the determinants encountered on site, the following recommendations should be adhered to during site works:

- Any proposed imported soils should be tested for contamination to ensure that they are suitable for the proposed end use as per Section 5.1.
- Site workers should wear gloves, boots and overalls and wash their hands before eating, drinking and smoking. Excessive dust generation should be avoided.
- It is recommended that during all excavations adequate ventilation should be maintained. If man entry is required, gas monitoring should be carried out as a precaution.
- Given the existence of made ground on the site it would be prudent to maintain vigilance during site clearance and construction, in case any areas of suspected contamination are encountered.
- If areas of suspected contamination are found then a suitably qualified person should undertake appropriate sampling, testing and further risk assessment.

2.4.3 Drinking water supplies

Due to the absence of elevated determinands encountered during the investigation and no significant historical previous uses, the use of protect-a-line is not anticipated. Further liaison with the utility provider is required

2.4.4 Further Investigation / Actions?

No further remedial actions are anticipated.

2.5 Review of Conceptual Site Model

Target (Receptor)	Potential Source-Pathway Linkage	Remedial Action Required (where appropriate)	Estimated Degree of Risk to Target Following remedial action where necessary
Site end users	Inhalation of soil gases, odours or dust.	No significant gas values encountered	Low
Site end users	Ingestion of, and skin contact with, contaminated soil.	Area around TP19 required 600mm clean cover system. Filed 5 topsoil to be used for POS end use	Low
Site end users	Ingestion of contaminants in vegetables etc. or in soils adhering to vegetables, etc	Area around TP19 required 600mm clean cover system. Filed 5 topsoil to be used for POS end use	Low
Construction/maintenance workers.	Inhalation of soil gases, odours or dust.	PPE	Low **
Construction/maintenance workers.	Ingestion of, and skin contact with, contaminated soil	PPE	Low **
Plants	Adverse effects on growth caused by presence of contaminants in soil	Area around TP19 required 600mm clean cover system. Filed 5 topsoil to be used for POS end use	Low
Buildings and Structures	Flow of ground gas into buildings. Asphyxiation, toxicity, explosion and fire hazards	No significant gas values encountered	Low
Foundations	Sulphate attack of foundations	Foundations to be designed accordingly	Low
Water Supplies	Hydrocarbons penetrating plastic water supply pipes.	Non anticipated	Low
Groundwater	Migration of soluble contaminants into groundwater on or off site	No significant sources identified	Low to Moderate
Surface water	Migration of soluble contaminants and/or direct run-off of contaminants	Non-anticipated	Low

** assumes basic PPE is used

3 REMEDIATION STATEMENT

3.1 Aims

Remediation aims are:

- Remove/treat ground contamination issues in order to protect human health and potential environmental receptors, and render the site suitable for the proposed development.
- Provide a stable development platform (to agreed levels and gradients) for subsequent construction of the proposed development and associated infrastructure.
- Satisfy planning requirements of the Local Planning Authority.
- Satisfy Environmental Protection Act 1990 Part IIa requirements of the Environment Agency Wales.

3.2 Remediation Scope

The following remedial works are required:

- General site clearance of surface materials and vegetation.
- Excavation of soil / brick rubble and removal of below ground obstructions.
- Re-grade of site to specified levels.
- Backfill existing former quarry with engineered fill.
- Provision of a minimum 300mm thick layer of clean site won soils in garden areas and soft landscaping. This cover layer should comprise 150mm topsoil and 150mm sub-soil. Note given that the contamination data shows natural strata to be clean it is anticipated that the existing natural soils will be suitable for both topsoil and subsoil (with the exceptions of Field 5 sourced materials and TP19 area of made ground). Care is required to ensure that the subsoil remains demolition material free for in the upper 300mm from surface, as per NHBC guidance for gardens. (see section 4.13)
- Provision of a minimum 600mm thick layer of 'clean' soils in garden areas within the vicinity of TP19. This cover layer should comprise 150mm topsoil and 450mm sub-soil. Care is required to ensure that the subsoil remains demolition material free for in the upper 300mm from surface, as per NHBC guidance for gardens (see section 4.13)
- Site strip of topsoil within Field 5 and stockpile separately for reuse in landscaped areas and or public open space.

3.3 Remedial Methodology

3.3.1 Site Set-up, Organisation and Safety

Site works will be supervised throughout by a suitably qualified Engineer, who will report to the Project Manager. Consultancy supervision may be part-time for certain activities, but must be full-time during the removal of any grossly contaminated soil\fill and any placement of fill to an engineering specification.

Site cabins and welfare facilities are to be established at a location to be agreed with the Engineer. All welfare facilities must be established in accordance with the relevant health & safety statutory requirements. Provision shall be provided on site for car parking for all site employees.

All site personnel will undergo a site-specific health and safety induction prior to commencement of work on site.

The Engineer will be informed prior to any proposed entry of a confined space or deep excavation. Entry must be restricted to suitably qualified and equipped personnel.

Works will be carried out with proper regard to current statutory requirements.

During the remediation works, all personnel on site will comply with guidance provided in the Health and Safety Executive (HSE) document "Protection of Workers and the General Public during the Redevelopment of Contaminated Land". In summary, the following shall be provided:

- Protective clothing, footwear and gloves. (Personnel should be instructed in why and how they are to be used).
- Hand-washing and boot-washing facilities.
- Smoking shall be limited to designated areas.

Note: Specialist PPE and decontamination units will be required for asbestos removal by a specialist. Detailed methodology of asbestos removal to be covered by third party method statements.

If at any time during the works, personnel begin to feel unwell, they are to inform the Engineer or Site Manager, who will determine appropriate action.

All visitors to site must enter and register at the main Site Office.

3.3.2 Responsibilities

Prior to the commencement of any works, in agreement with the Engineer, The Client will:

- Establish the boundaries of the site and the working areas.
- Undertake a dilapidation survey of site boundaries, adjacent properties and highways, via dated photographs or video footage.
- Liaise with the Local Authority regarding working hours, noise\dust\odour control, and protected

trees.

- Liaise with the Local Water Company regarding any proposed discharge to sewer.
- Complete a full services search and liaise with all relevant utility companies regarding work in close proximity to their apparatus.
- Inform the Engineer of any risk, identified and assessed, which could impact upon the Engineer's activities.
- Prepare the necessary COSHH statements and Health & Safety Plan in accordance with CDM regulations.

The contractor will ensure that:

- Secure the full site boundary (if necessary, provide and erect herras-type fence to protect members of the public from the works).
- Personnel, plant, materials and other equipment related to the contract are confined within the boundaries of the site.
- Any live services lying within the site boundary are marked and protected, or appropriate arrangements made to truncate them.
- Good practices relating to personal hygiene are adopted.
- Suitable precautions are implemented at all times to prevent off-site migration of pollutants via airborne dust and vapours.
- Suitable precautions are taken to prevent the spread of mud and debris on public highways.
- Refuelling of mobile plant is undertaken in a designated area. Above ground oil storage tanks shall comply with the requirements of Pollution Prevention Guideline PPG2. A spill kit shall be kept on site, adjacent to the designated refuelling area.

3.3.3 Engineering Supervision and Validation

Betts understand that the Engineer will ensure that the requirements of this RS are complied with in a safe and orderly manner.

The responsibilities of the Engineer shall include, but not be limited to, the following:

- Ensuring that all site personnel are suitably qualified and given an appropriate induction at the beginning of their first day.
- Supervision of the remedial and ground preparatory works.
- Advice on the correct handling of materials and conditions encountered.
- Guidance on the appropriate protective clothing and safety equipment that is to be made available and used.
- Ensuring that personal hygiene arrangements are adequate.
- Retrieval of soil and water samples and the subsequent scheduling of appropriate laboratory analysis to enable validation of various aspects of the works, and to advise the Project Manager of progress.
- Liaison with statutory authorities as required.

The Engineer will maintain records of the works to include the following:

- Daily record sheets to include a summary of the day's activities.
- Date and weather conditions.

- Plant, personnel and visitors present.
- Aspects relating to Health and Safety, Environmental Control, or non-compliance with this RS.
- Site surveys as necessary to record the locations of demolition, excavation and filling activity.
- Test results.

On satisfactory completion of all the works the Engineer will prepare a Validation Report. Copies of the Validation Report will be issued to the Client and the Local Authority.

The Validation Report will stand as certification that the remedial and ground preparatory works have been carried out in accordance with this RS.

The **Validation Report** will include:

- A summary of the preparatory & remedial works undertaken, including any works associated with unforeseen ground conditions.
- Geotechnical test results associated with ground improvement or re-engineering beneath proposed highways and buildings (if required).
- Copies of any correspondence with Regulators relating to specific aspects of the remedial works.

For reasons of practicality, detailed daily records prepared by the Engineer during the works will not be appended to the Validation Report, but copies can be viewed at Betts offices if required.

The above recommendations will take account of the actual remedial works undertaken, and may differ significantly from recommendations originally presented in the site investigation report and remedial strategy.

4 REMEDIAL WORKS (SPECIFIC OBJECTIVES)

4.1 Demolition & Site Clearance.

Phased site clearance topsoil strip, removal of trees, bushes and shrubs required as part of the redevelopment of the site will be undertaken.

4.2 Excavation of Hardstanding and Foundations

N/A

4.3 Processing of Arisings

N/A.

4.4 Construction

4.4.1 Excavation of footings.

Heavy plant will be operated generally between the hours of 8:00AM and 6.00 PM Monday to Friday, 8:00am to 1:00 PM Saturday.

Noise levels will generally be less than the 80 – 85 dB range, with occasional breaches in excess of 85 db. Periods of noise generation in excess of 85 dB are anticipated as being during the initial enabling works and slab removal stage and thereafter for short periods. All construction plant will be selected from well maintained and silenced stock.

Site vigilance for unforeseen hotspots will be undertaken with the method of dealing with unforeseen briefed to site management.

4.4.2 Arisings

Wherever possible retention of arisings for reuse on site will be made. Foundation arisings of natural clay has been deemed chemically suitable for clean cover system and may be feasible to use in the lower capping layers and earthworks (subject to geotechnical suitability)

Any material that is deemed to be unsuitable for re-use will be removed from the site to licensed landfill.

Control of surface erosion post site strip will be monitored and provision made where required for sediment traps on the existing watercourses made.

4.5 Dust, Vapour & Odour Control

The excavation of fill should not present a significant problem with regard to emission of dust during excavation and transport because the material to be excavated should have a high moisture content. Nonetheless, the monitoring and mitigation measures outlined below may be required if dust, vapour or odour are noticeable.

4.5.1 Odour Monitoring

If necessary, olfactory monitoring for odour nuisance will be undertaken at the site boundary down-wind of the excavation area during all excavation works. Odour monitoring will be carried out at these locations no less than three times a day during active site works.

At each monitoring event, the odour level will be subjectively classified as none, slight, moderate, or high, where:

- a slight odour level is detectable but not particularly noticeable,
- a moderate odour level is noticeable but not offensive, and
- a high odour level is offensive.

If high odour levels are detected in the same location on more than two occasions during any three-day period, then one or more of the actions outlined Sections 4.13 to 4.15 below will be undertaken in order to reduce the odour levels.

4.5.2 Trigger Levels

Proposed action limits for requiring respirator protection in the vicinity of the excavations and for taking corrective action to mitigate against the generation of air-borne dust or volatile organic contamination are outlined below. They are based on EH40/2002, Occupational Exposure Limits, Health and Safety Executive. EH40 trigger levels for total VOCs and dust are:

VOC & Dust Trigger Levels

Determinand	Long-term exposure limit (8 hour time-weighted average)	Short-term exposure limit (15 minute reference period)
Total VOCs	1 ppm	3 ppm
Dust	4 mg/m ³	12 mg/m ³

4.9.10 The long-term exposure limit for total VOCs is based on the EH40/2005 long-term exposure limit (8-hour time-weighted average) for benzene. The short-term exposure limit is set at three times the long-term exposure limit as recommended in EH40/2002.

The long-term exposure limit for dust is based on the EH40/2005 long-term exposure limit (8-hour time-weighted average) for respirable dust, which is taken from the General COSHH Approved Code of Practice, 1997. Again, the short-term exposure limit is set at three times the long-term exposure limit.

4.5.3 Mitigation

At all times during the excavation works, Best Practicable Means shall be employed to minimise dust, odour generation and their emission off site.

If dust concentrations in air exceed the long-term trigger levels in the vicinity of the excavation area, but are below the long-term trigger levels at the site boundary, then respirator protection will be required for all site personnel working in the excavation area.

Respiratory protection that conforms to the European Product Directive (CE) shall be readily available for personnel exposed to odours. Twin cartridge respirators, that conform to EN140, fitted

with class A1 filters cartridges, which conform to EN141 (organic gases and vapours), shall be used. If highly odorous material is encountered on site then masks with Class A2 filters shall be used.

In addition, one or more of the following corrective actions to mitigate against the generation of airborne dust or volatile organic contamination will immediately commence:

- Mist and water spraying to eliminate dust and/or reduce generation of volatile compounds.
- Reduction of the exposed active excavation area by backfilling or covering to reduce the generation of volatile compounds.

If concentrations in air exceed the long-term trigger levels at the site boundary then excavation activities will be stopped immediately and one or more of the above corrective actions will commence. Work will not begin again until the air quality at the site boundary has returned to an acceptable level and only after all reasonable actions have been taken to prevent the air quality at the site boundary from again declining to an unacceptable level.

4.6 Export to Landfill

Any material exported from site to landfill will be hauled by a registered waste carrier in accordance with the requirements of the Duty of Care Regulations, 1991 and the Landfill (England & Wales) Regulations 2002.

A transfer note shall be completed, signed and retained by the parties involved. The transfer note shall include the volume of waste, the nature of the material and a statement of its chemical composition, details of the source and destination sites, and details of the haulier.

In order to protect the general public from dust, wagons that are to be used for the haulage of the contaminated material from the site will be sheeted. In addition, the Contractor must ensure that no fluids seep from the wagons.

In order to provide the landfill facility with information regarding chemical composition of the waste, analysis results from the ground investigation and the desk study will be supplied to the site prior to removal for classification.

As of 16th July 2005 the Waste Acceptance Criteria of the Landfill Regulations 2002 were fully implemented, which will result in the enforcement of a more stringent approach to waste assessment and its disposal to landfill.

All hazardous waste going for disposal at landfills must be classified according to the new European Waste Catalogue (EWC).

Contaminated soils are "Mirror entries" in the EWC. Waste contaminated soils may be classified as either *hazardous* or non-hazardous depending on the concentrations of "dangerous substances" in the waste soil. An assessment of the composition of the waste soil will therefore be undertaken to determine if it is hazardous waste.

The WAC set threshold concentrations for leachable components of the waste stream and landfill operators will have waste acceptance procedures in place to ensure that only compliant waste is landfilled. Most waste will need to be treated before it can be landfilled to reduce its quantity and the hazard it presents. Leaching compliance testing will be required in accordance with BS EN 12457-3:2002.

In addition the site will be operating under a Site Waste Management Plan recording both import and export of materials.

4.7 Backfill of Excavations

Excavations (to remove former quarry walls, relict structures, contamination etc) will be “surveyed in” and backfilled as necessary to achieve the desired levels, with suitable materials and subjected to compaction specification, to be agreed with the Engineer.

However, where an excavation conflicts with the footprint of a proposed adopted highway, compaction in accordance with the Specification for Highway Works Table 6/1 will be undertaken.

4.8 Cut and Fill / Regrade

Existing topographic levels and finished floor levels for proposed properties are to be advised on final design.

4.10 Boundary Issues

The Client’s Designer should ensure that proposed levels tie in with the surrounding infrastructure, and ground levels of adjacent properties.

4.11 Highways

The contractor will agree acceptable performance criteria, and an appropriate Specification for any necessary ground improvement, with the Client and the adopting authority where necessary.

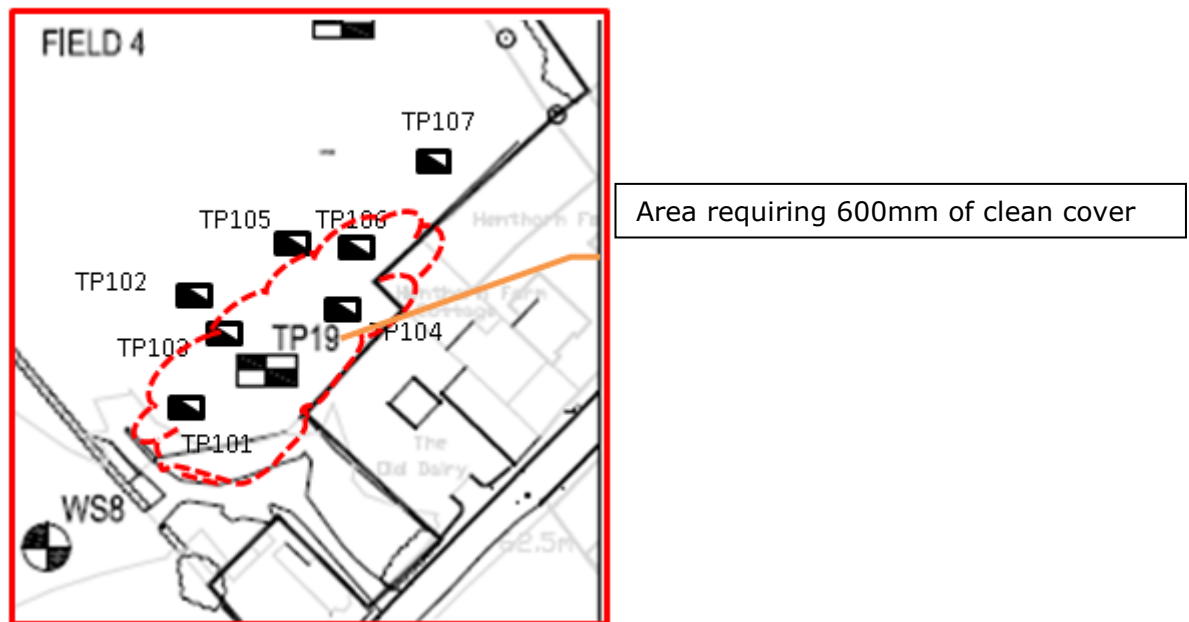
The Contractor will arrange for the necessary compliance testing to be undertaken at formation level on road alignments, as required by the adopting authority and Engineer.

4.12 Control of Water

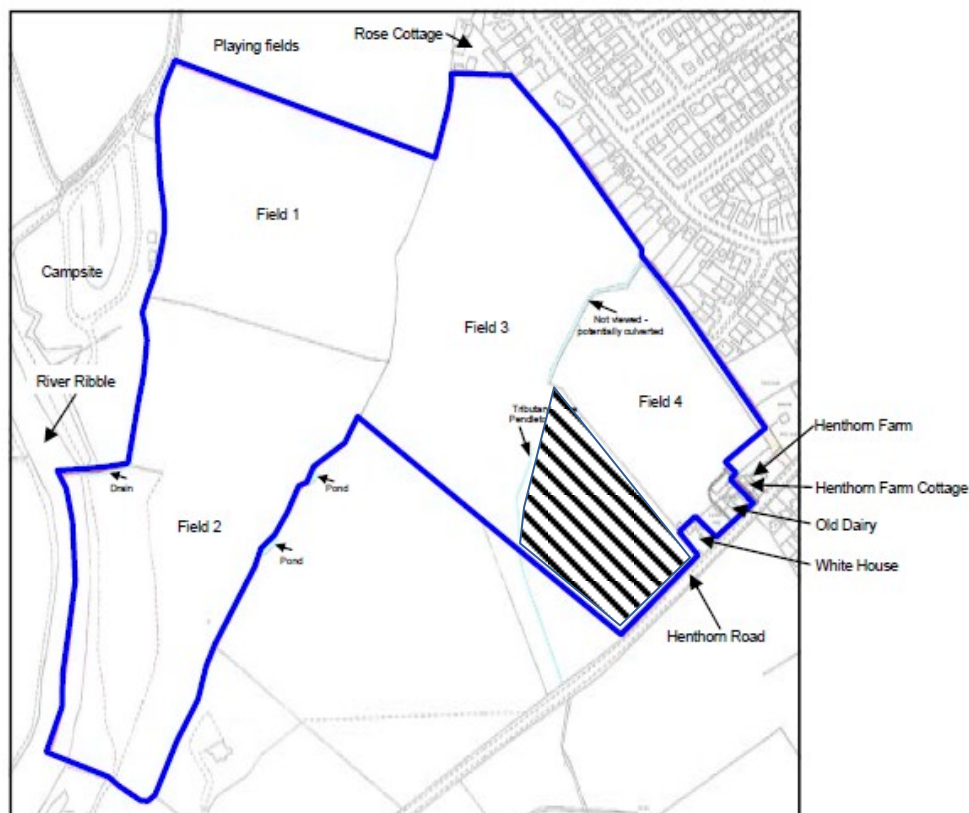
Shallow groundwater was as perched water upon the clay. Shuttering and pumping is likely to be required for excavations. Consideration to sediment / water run-off is required to ensure protection to existing water courses is maintained during earthworks phasing.

4.13 Selection and Placement of Cover Materials

The Remediation Strategy for the site only requires cover system to the area around TP19. 600mm of cover is required using validated soils and thicknesses.



Field 5 (hatched below) has demonstrated slightly elevated 'coal' derived PAH's. Whilst the risk is deemed negligible for domestic garden use it is suggested that this topsoil is stripped and stockpiled for reuse in areas of lower risk i.e. public open space.



5 METHODOLOGY/PROGRAMME

5.1 Imported Soil

Given the nature of the subject site it is unlikely that importation of soils will be required. However the following protocol is to be used should any import be required.

- Desk study undertaken to establish source
- Source used to determine sampling frequency/chemical analysis scheduling
- Engineer to attend source site and collect representative samples for assessment
- Samples analysed and screened for end use suitability for residential with root uptake
- Validation from Local Authority for suitability
- Import soil to site and place in garden areas to the agreed cover thickness
- Engineer to attend site and undertake photographic cover thickness validation via hand dug exposure pits on the basis of 1:3 gardens. Report to be produced and submitted to the local Authority for approval

150mm topsoil
150mm subsoil (free of coarse granular) This is anticipated to be existing natural soils on site

The above is proposed to comply with NHBC Chapter 9 regulations regarding physical composition of cover (i.e. no coarse granular material within the first 300mm) and exceeds the minimum requirement of 100mm depth of topsoil – extract from Ch9 below:

9.2 - S5 Garden areas shall be free from obstructions beneath the surface old foundations, concrete bases and similar obstructions occurring within 300mm of the finished ground surface should be removed.

9.2 - S6 Garden areas shall be adequately prepared for cultivation construction rubbish and debris should be removed from garden and other areas around the home. Garden areas should be provided with topsoil to a thickness of not less than 100mm. The topsoil should not contain contaminants which are likely to present a hazard to users of the garden area.'

Any soils intended for use as part of the clean cover will be tested at source or stockpiled on site until approved for use by the Supervising Engineer. Testing will be carried out at a rate of 1 test per 150m³ for 'greenfield' sites, 1 test per 50m³ for brownfield sites or a minimum of 3 samples taken for statistical analysis with the results compared to CLEA/LQM 2009 threshold concentrations where appropriate.

Chemical analysis should be assessed using a desk study/details of historic use of the site where the imported soil originated. Chemical analysis is likely to include (but is not limited to); CLEA Metals (Arsenic, cadmium, chromium (Vi), lead, mercury, selenium, copper, nickel and zinc), pH values, Sulphate - soluble 2:1 extract, speciated polycyclic aromatic hydrocarbons (PAH), extractable petroleum hydrocarbons (EPH), TPH CWG and Organic matter.

This work may be undertaken as part of the contract for the preparatory & remedial works, in which case imported soils should be stockpiled in a location agreed with the Engineer. Alternatively, the developer may choose to import soil at a later stage in the development.

In order to demonstrate that the required depth of 'clean' cover material has been placed across the required areas (i.e. within garden areas and areas of landscaping) a post-fill survey will be undertaken by hand-dug pits and provision of photographic evidence of the cover system within rear gardens. This will be provided to the contractor for their records.

5.2 Contingency for Unknown

There is at this stage a potential risk of localised, unidentified contaminated Made Ground being present at the site.

Should any suspicious material be encountered during the remediation works, the area will be investigated further by a Betts geo-environmental engineer and sampled as necessary. The Contaminated Land Officer at the Local Authority will also be notified if the material is deemed to represent a risk to environmental receptors or public health. Samples will be forwarded to a UKAS accredited laboratory for a suite of analytical testing deemed appropriate based upon a visual and olfactory appraisal of the material identified.

Once the results of any analysis are known, the required remedial action (if any) will be determined.

5.3 Construction Workers

Due to the presence of contaminated Made Ground soils, a risk exists (in the short term) to any ground/construction workers involved in the redevelopment of the site.

A full discussion of the results of existing chemical analysis and the levels of contamination within these soils is included within the Pre-Tender Health and Safety File. The Contractor is aware of the presence of such soils and has therefore allowed for adequate Personal Protective Equipment to be provided on site.

It is recommended that full reference should be made to current guidance documents such as the HSE document "Protection of Workers and the General Public during the Redevelopment of Potentially Contaminated Land" HS (G) 66, HSE.

The results of all relevant chemical analysis will be provided to the relevant service providers in order to confirm any special precautions that may be required in respect of the installation of services and the protection of their workers.

5.4 Site Certification

Once the remediation works have been undertaken, a 'completion' report (as described in Section 3.5 of this report) will be prepared. This will comprise relevant site records and stand as certification that the appropriate remediation works have been carried out in accordance with the agreed redevelopment strategy. Reports will be submitted to the Local Authority for their approval, thereby enabling the release of the site for subsequent development.

5.5 Programme of Remedial Actions (Implementation Timetable)

Date of commencement	Anticipated completion	Action	
TBA	Unknown	Roadway and drainage to allow safe access and egress to and from site as well as means of controlling surface water runoff.	Initial Phase of site establishment.
Unknown	Unknown	Earth works - Continued site vigilance for unforeseen contamination.	Earthworks will be at the start of the project. Monitoring of the work will be ongoing and be by Contractor; records will be kept on site.
Unknown	Unknown	Foundation construction - Continued site vigilance for unforeseen contamination.	Foundation construction will be just after / partly concurrent with earthworks working in zoned areas. Monitoring of the work will be ongoing by the Contractor; records will be kept on site. Upon encountering unforeseen contamination Betts and the Local Authority will be informed.
Unknown	Unknown	Selection of onsite source of topsoil	Cover thickness to be proven in gardens in the vicinity of TP19 in field 4

Appendix A – Drawings

Drawing No.	Title
	Proposed Layout
	Cut and Fill drawing - Awaited

Appendix B – Third Party Reports

Report Ref:	Title
KB450-03/AES/HB/GP	PHASE 1 DESK STUDY REPORT For LAND OFF HENTHORN ROAD, CLITHEROE, LANCASHIRE 9 June 2010 Gladman Developments Limited Johnson Poole and Bloomer Limited (JPB)
J-D0968.00_R1_NLH	GEO-ENVIRONMENTAL INVESTIGATION REPORT For GLADMAN DEVELOPMENTS LIMITED On a site at HENTHORN ROAD, CLITHEROE dated 28 May 2012 Job No: J-D0968.00 by Opus Doncaster

Report Ref:	Title
KB450-03/AES/HB/GP	PHASE 1 DESK STUDY REPORT For LAND OFF HENTHORN ROAD, CLITHEROE, LANCASHIRE 9 June 2010 Gladman Developments Limited Johnson Poole and Bloomer Limited (JPB)

9 June 2010

KB450-03/AES/HB/GP

For the attention of:
Gladman Developments Limited
Gladman House
Alexandria Way
Congleton
Cheshire
CW12 1LB

PHASE 1 DESK STUDY REPORT
For
LAND OFF HENTHORN ROAD,
CLITHEROE, LANCASHIRE

This report was carried out in accordance with JPB Quality Management procedures.

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CONTENTS

<u>Text</u>	<u>Page No.</u>
1.0 INTRODUCTION	1
2.0 SITE DESCRIPTION AND SITE HISTORY	2
2.1 Site Description.....	2
2.2 Site History.....	5
3.0 GEOLOGY, MINING, GROUND STABILITY HAZARDS AND RADON GAS	7
3.1 Geology.....	7
3.2 Mining and Mineral Extraction	7
3.3 Ground Stability Hazards.....	8
3.4 Radon	8
4.0 ENVIRONMENTAL SETTING.....	9
4.1 General	9
4.2 Hydrogeology.....	9
4.3 Hydrology.....	9
4.4 Flood Risk	11
4.5 Landfill and Waste Management Sites	11
4.6 Storage of Hazardous Substances and Authorisations	12
4.7 Ecology	12
4.8 Other Environmental Information.....	13
5.0 CONCEPTUAL SITE MODEL AND QUALITATIVE RISK ASSESSMENT	14
6.0 GEOTECHNICAL AND OTHER CONSIDERATIONS.....	16
7.0 CONCLUSIONS	17
8.0 RECOMMENDATIONS	19
9.0 GENERAL	20

Drawings

KB450/01 Study Boundaries and Layout

Appendices

Appendix A Information Consulted
Appendix B GroundSure Report
Appendix C Historic Plans

1.0 INTRODUCTION

- 1.1 Further to the written instruction received on 26 May 2010 from Gladman Developments Limited (GDL), Johnson Poole and Bloomer Limited (JPB) is pleased to present a Phase 1 Desk Study Report for the site known as land off Henthorn Road, Clitheroe. The site's location and study boundaries are shown on Gladman Drawing 2010-001-100 and JPB Drawing KB450/01.
- 1.2 This report has been written for GDL and is required in order to highlight any potential environmental risks and liabilities associated with the development of the site, arising from its past and present uses. Information is also provided relating to the on site ground conditions, together with any issues which could lead to potential financial liabilities that may affect the land value or impact upon potential redevelopment options.
- 1.3 At the time of writing, it is understood that GDL is intending to obtain outline planning permission for the development of up to 270 residential dwellings.
- 1.4 This report is based on desktop research, which has included a search of the JPB Archive containing geological maps and memoirs, historical Ordnance Survey plans and other published information as detailed in Appendix A.
- 1.5 A site walkover inspection was carried out on 2 June 2010, as part of this commission, and a GroundSure EnviroInsight and GeoInsight Report has been purchased on behalf of GDL for the site. Relevant information from the GroundSure Report is cited in this report and a full copy of the report is presented in Appendix B. Historic plans for the site are presented in Appendix C.
- 1.6 Based on the information held within the JPB Archive and available from the British Geological Survey, The Coal Authority Gazetteer and the Law Society's Guidance Notes (2006), it was not deemed necessary to purchase a Coal Authority Coal and Brine Report for the site.
- 1.7 This report and related documents have been prepared for the sole use of the specified client in response to an agreed brief, for a stated purpose and at a particular time and its application must be made accordingly. No duty of care extends to any other party who may make use of the information contained therein. The information discussed in Section 9.0 – General of this Phase 1 Desk Study Report should be consulted and noted.

2.0 SITE DESCRIPTION AND SITE HISTORY

2.1 Site Description

General

- 2.1.1 The site is located on the outskirts of Clitheroe, approximately 1km southwest from the town centre. The centre of the site is at National Grid Reference SD 729 409 and the site's location is shown on Gladman Drawing 2010-001-100.
- 2.1.2 Occupying an approximate area of 16.4ha (hectares), the site forms an irregularly shaped plot of land, which is an inverted 'v' shape in plan view. The site is recorded at an approximate elevation of 60m AOD (Above Ordnance Datum) towards the site boundaries, with the central part of the southern boundary recorded at 66m AOD.
- 2.1.3 A site walkover was undertaken by JPB on 2 June 2010 and the following information is a description of the conditions on site at the time of the visit.

Site Boundaries and Adjacent Site Uses

- 2.1.4 The majority of the site's boundaries were marked by hedgerows comprising hawthorn and mature trees such as oak, ash and maple. Occasional wire mesh fencing and wooden post fencing (approximately 1.2m high) was also present.
- 2.1.5 Playing fields (football pitches) associated with the Roefield Leisure Centre were present immediately beyond the main section of the northern site boundary, with Endisford Road (B6243) located approximately 235m north of the site. Clitheroe Kennels and Cattery was present immediately beyond the northeast corner of the site at Rose Cottage. A residential housing estate extended along and beyond the north-eastern site boundary. In one location it appeared that one of the properties had extended their rear garden on to the site. A track extended along the inside of the southern half of the northeast site boundary and connected the site with Henthorn Road.
- 2.1.6 The southeastern site boundary weaved through the boundary lines of several residential properties fronting onto Henthorn Road. The site boundary was noted to be as such that the property known as the 'Old Dairy' was within the site boundaries, whilst the remaining properties, namely the 'White House', 'Henthorn Farm Cottage' and 'Henthorn Farm' were located off site. Part of the boundary line around the 'White House' was marked by a stone wall approximately 1.5m high. Henthorn Road trended northeast to southwest immediately beyond the south-eastern site boundary and terminated approximately 660m southwest of the site (along the route of the road) at a sewage works, landfill site and Household Waste Disposal Site. Beyond Henthorn Road, to the southeast, were further residential properties and open fields.
- 2.1.7 Two ponds were present along the western half of the 'v' shaped southern boundary, as identified on the latest edition of Ordnance Survey plan. The ponds were observed to be heavily vegetated and almost dry at the time of the site walkover. Open fields continued to the south, with Siddows Hall (a residential property) located immediately southeast of the western half of the 'v' shaped southern boundary. The off site fields sloped down to the southeast towards the tributary of the Pendleton Brook.

- 2.1.8 The River Ribble marked the southern half of the western boundary and was noted to be flowing at a moderate speed in a southerly direction. Beyond the River Ribble, the land was noted to be being used as pasture for sheep. On the opposite side of the river bank from the site, the immediate edge of the river bank was observed to slope steeply down to the river by approximately 3m, with some slope failure noted.
- 2.1.9 A campsite (Clitheroe Camping and Caravanning Site) was located immediately west of the northern half of the western site boundary, with a number of small buildings present along the boundary line. The buildings were associated with the campsite i.e. a shop with gas bottle storage (caged), toilet block and laundry facilities. The campsite was noted to be approximately 1m to 2m lower than the adjacent, on site land and the difference in height generally reduced towards the north. A miniature railway was located next to the campsite approximately 120m northwest of the site and Edisford Riverside Picnic and Recreation area was located adjacent to the River Ribble.

Site Layout

- 2.1.10 The site was divided into four fields and for ease of reporting the fields are numbered 1 to 4 on JPB Drawing KB450/01. Each of the fields comprised long grasses, sedges, buttercups, docks, dandelions and occasional cuckoo flowers. The fields were divided by hedgerows predominantly comprising hawthorn with occasional mature trees such as oak and ash. Nettles were also present along the base of the hedgerows.

Field 1

- 2.1.11 Field 1 formed the northern most part of the site and was square in plan view. The north-western half of this field sloped gradually down towards the western boundary, with the remainder being generally flat. An open gate was located in the northeast corner of the field which connected it to Field 3. Gravel was noted across the field access.

Field 2

- 2.1.12 Field 2 was generally rectangular in plan view with its long axis orientated north to southwest. The main eastern part of the field was generally flat, with the remainder noted to slope steeply down to the River Ribble. A gravel covered public footpath; The Ribble Way, trending within the site boundaries from the centre of the southern field boundary (accessed by a wooden stile) to the eastern bank of the river, where it continued to trend in a northerly direction off site. The river bank was noted to comprise long grasses, sedges, buttercups and red campion with occasional mature trees along the public footpath. The river bank sloped down steeply by approximately 2.5m to the waters edge of the River Ribble.

- 2.1.13 A section in the southern half of the field was fenced off from the River Ribble and the northern half of the field with wire mesh and barbed wire fencing (approximately 1.2m high). This area was being used for livestock grazing (cows) and a trough was located in the north of the fenced area adjacent to a gate through to the remainder of the field. Occasional clumps of hawthorns and shrubs were also noted within the grazing land. A land drain was noted along part of the western boundary, which trended east to west and discharged to the River Ribble. At the time of the site walkover the land drain was noted to be dry and heavily vegetated along the majority of its length with a culverted section (concrete pipe) beneath The Ribble Way public footpath.

- 2.1.14 Two access gates were located in the northeast corner of the field, which led through to Field 1, in the north, and to Field 3, to the northeast.

Field 3

- 2.1.15 Field 3 formed the central part of the site and was broadly 'L' shaped in plan view. The main section of the field, west of the tributary of the Pendleton Brook, was generally flat in the west, and in the east gradually sloped down to the southeast. A circular depression, with a diameter of approximately 18m and a depth of 1.5m, was located in the north-east of the field. Vehicle tracks crossed the southern part of the field, from the access gate to Field 2 in the west, and the access gate to Field 4 in the east.
- 2.1.16 In the southeast section of the field, a rectangular area was fenced off (wire mesh and barb wire fencing approximately 1.2m high) for grazing livestock (cows) in the west, whilst the remainder was open and sloped down gradually towards the southeast to Henthorn Road. The tributary of the Pendleton Brook trended generally north to south through the section fenced off for livestock grazing in the south of Field 3. The watercourse was noted to contain shallow waters at the time of the site visit, flowing in a southerly direction, and was surrounded by vegetation. The watercourse issued from a concrete culvert. The grazing land sloped down to the watercourse, with the banks becoming steeper towards the southern boundary.
- 2.1.17 The current Ordnance Survey (OS) plan annotates the Pendleton Brook tributary to extend along the field boundary line between Field 3 and Field 4 together with the section viewed in the south of Field 3. The central section of the on site tributary is shown to be culverted on the OS plan. The northern section between Field 3 and Field 4 was not viewed during the site walkover, although the field boundary was densely vegetated. It is possible that the central culverted section of the watercourse has been extended to include the northern part of the tributary.

Field 4

- 2.1.18 Field 4 was rectangular in plan view and sloped down slightly from the centre of the field down to the southeast and northwest. An overgrown track with occasional gravel was located immediately adjacent to the north-eastern field boundary (but within the main site boundary) and was lined by several mature trees. The track led to a wooden gate in the far eastern corner and through to Henthorn Farm and Henthorn Road.
- 2.1.19 The 'Old Dairy', a residential property, was located centrally beyond the southeast field boundary and comprised two, two storey buildings with pitched, tiled roofs and were noted to have a newly refurbished appearance. The 'Old Dairy' was surrounded by landscaped areas and a brick driveway in good condition. A plastic, self bunded tank in good condition holding approximately 2,500litres was located adjacent to Henthorn Road and is presumed to contain heating oil for the residential property. Immediately to the southwest of the 'Old Dairy' was an area noted to be covered with poor condition tarmac. The area was accessed from a gate off Henthorn Road and from Field 4.
- 2.1.20 An area fenced by 1.5m high wooden post and rail fencing was located in the south of Field 4 and provided access to the 'White House'; a residential property in poor condition that was in the process of being renovated at the time of the site walkover.

Services

- 2.1.21 A manhole cover was noted in the far northwest corner of Field 2, with a further cover noted adjacent to the 'Old Dairy'.
- 2.1.22 Overhead telegraph cables were noted trend from a telegraph pole located opposite the 'Old Dairy', on the far side of Henthorn Road, which connected with the residential properties fronting onto Henthorn Road i.e. 'White House', 'Old Dairy', 'Henthorn Farm Cottage' and 'Henthorn Farm'.
- 2.1.23 Overhead electricity cables trended across the central section of Field 2 in a north-westerly direction and in a south-westerly direction across the southern third of the field.
- 2.1.24 No gas mains are shown to cross the site on the National Grid service plan. However, the properties fronting onto Henthorn Road in the east of the site are served by a low pressure gas main laid in the nearside of Henthorn Road.
- 2.1.25 A search has been undertaken to determine the proximity of underground oil / fuel pipelines and cable networks. The search determined that the site is **not** in the zone of interest for any of the following service operators.

- | | |
|---|--|
| • BOC Limited (A Member of the Linde Group) | • Ineos Enterprises Limited |
| • BP Exploration Purbeck Southampton Pipeline | • Mainline Pipelines Limited |
| • BPA | • Manchester Jetline Limited |
| • Centrica Energy | • Marchwood Power Limited (Gas Pipeline) |
| • ConocoPhillips (UK) Limited | • NPower CHP Pipelines |
| • ConocoPhillips Limited Humber Refinery | • Oikos Storage Limited |
| • Coryton Energy Co Limited (Gas Pipeline) | • Premier Transmission Limited (SNIP) |
| • E-on UK Plc (Gas Pipelines Only) | • Sabic UK Petrochemicals |
| • Esso Petroleum Company Limited | • Scottish Power Generation Limited |
| • FibreSpeed Limited | • Shell UK Limited |
| • Geo Networks Limited | • Total UK |
| • Government Pipelines & Storage System | • Wingas Storage UK Limited |
| • INEOS Manufacturing (Scotland and TSEP) | |

2.2 Site History

- 2.2.1 A review of the relevant County Series (CS) and Ordnance Survey (OS) historical maps has been undertaken to determine the previous usage of the site and its surroundings. The relevant plans are reproduced in Appendix C.

On site

- 2.2.2 The 1884 CS plan at 1:2,500 scale shows the site and its surroundings to have been predominantly fields, divided by tree lined field boundaries. A watercourse is shown to have trended north to south in the east of the site and a pond was located on the 'v' shaped southern site boundary, largely as present day. The River Ribble is also shown to have trended north to south in the southwest of the site with a footpath running within the site boundary, again as present day. Henthorn Road is already constructed at this time, in the southeast of the site, with buildings present along it annotated as 'Henthorn Villa'. A track is noted to have trended from Henthorn Road in the far southeast of the site, along the northeast site boundary, to a feature that is annotated as 'old quarry'. This feature was noted during the site walkover as a circular depression, together with the track.

- 2.2.3 No changes are noted on site until the publication of the 1910 CS plan at 1:10,560 scale and the 1912 CS plan at 1:2,500 scale, where a small building is shown to have been constructed centrally along the western site boundary. This building is only shown on these two plan editions and is likely to have been agricultural in nature.
- 2.2.4 A second pond is annotated along the 'v' shaped southern boundary on the 1932 CS plan at 1:2,500 scale and a land drain is shown to feed into the River Ribble in the far west of the site. These features still remain present today.
- 2.2.5 'Henthorn Villa' is first shown as 'Henthorn Farm' on the 1964 OS plan at 1:2,500 scale. No further significant changes are noted on site from this time to present day.

Off Site

- 2.2.6 The site was situated predominantly within open fields throughout the first part of the 1900s. The main features of note, from the late 1800s to the mid 1900s, are Rose Cottage which was situated immediately north of the site and Siddows Hall, located immediately south of the site. Further afield the Lancashire & Yorkshire Railway Line (Bolton, Blackburn & Hellifield) is shown to have trended from the northeast to the south approximately 450m east of the site, with the town of Clitheroe trending north-easterly beyond. Filter beds are shown to have been located approximately 350m south of the site and a Sewage Farm (Clitheroe Corporation) is shown to have extended from approximately 500m away.
- 2.2.7 The 1930 CS plan at 1:10,560 scale shows a refuse destructor to have been located approximately 400m south of the site. By the early 1970s the Sewage Farm is shown as a Sewage Works with various tanks present and the refuse destructor is no longer annotated. The 2002 OS Plan at 1:10,000 scale annotates a Household Waste Disposal Centre and landfill site to have been present from approximately 400m south of the site, as present day, in the vicinity of the former refuse destructor and Sewage Works.
- 2.2.8 From the mid 1950s, residential development is shown to have commenced northeast of the site, with the development shown as present day by the 2002 plan edition. Recreation ground is shown immediately north and northwest of the site in the 1970s, which is, in part, developed as a caravan site and miniature railway (west of the site) by 2002. No further significant changes are noted.

3.0 GEOLOGY, MINING, GROUND STABILITY HAZARDS AND RADON GAS

3.1 Geology

- 3.1.1 Made Ground (artificial) deposits are not mapped across the site by the British Geological Survey (BGS). However, a limited thickness of Made Ground, most likely comprising reworked natural materials, is anticipated across the site as a result of agricultural activities on site. There is also potential for inert construction materials i.e. brick, concrete, gravel and sand etc to be present where development has occurred adjacent to the site i.e. to the east.
- 3.1.2 Information published by the BGS on Sheet 68 indicates the presence of Glacial Till across the entire site. In the far southwest of the site, alluvial deposits associated with the River Ribble are also mapped.
- 3.1.3 The permeability of the Glacial Till and alluvial deposits are likely to be variable across the site, with a low to high permeability, which will depend on the composition of the materials i.e. sand or clay.
- 3.1.4 The BGS indicate the underlying solid geology to comprise the Carboniferous aged Clitheroe Limestone Formation and Hodder Mudstone Formation. The Clitheroe Limestone Formation is described as predominantly pale grey and commonly coarsely crinoidal packstone and wackestone (limestones) with subordinate grainstone (clastic rock) and mudstone, whilst the Hodder Mudstone Formation is described as predominantly grey to dark grey mudstone, with subordinate and variable detrital limestone, siltstone and sandstone. Mudmound reef limestones are present within both formations.
- 3.1.5 The permeability of the bedrock is indicated to be low in the GroundSure Report, with groundwater movement is likely to be through fracture flow.
- 3.1.6 An unnamed geological fault is conjectured to trend northeast to southwest approximately 40m southeast of the site, down throwing strata to the southeast, with a further unnamed fault conjectured to be approximately 700m northeast of the site, aligned northwest to southeast, which downthrows strata to the southwest.

3.2 Mining and Mineral Extraction

- 3.2.1 The Law Society's Guidance Notes, Directory of Coal Mining Searches (2006) and the Coal Authority Gazetteer, indicated that a coal mining search was not required for the subject site. In addition, the department of the Environment (DOE) Review of Mining Instability in Great Britain (1991) indicates the site is not located in an area where there is evidence of mining instability relating to coal or other mineral extraction activities.
- 3.2.2 Historic researches indicate a localised area, in the northeast of the site, to have been quarried which was annotated on the 1884 historic plan as 'old quarry' and still remains annotated on the current OS plan. A small circular depression can be seen on aerial photographs of the site and was viewed during the site walkover. It covers an approximate area of 18m by 18m and was observed to be approximately 1.5m deep. It does not appear to have been infilled.

- 3.2.3 There are no current BGS ground workings recorded within a 1km radius of the site.
- 3.2.4 Mining and mineral extraction activities on and off site are considered **not significant** to the development of the site. However, consideration to the development of the site will need to be given surrounding the 'old quarry'.

3.3 Ground Stability Hazards

- 3.3.1 The GroundSure Report, citing information provided by the BGS, records the following ground stability hazards for the site:

- Very low risk of shrinking and swelling clays;
- Very low risk from landslides (natural features only);
- Very low risk of ground dissolution;
- Negligible risk of compressible ground relating for the Glacial Till;
- Moderate risk of compressible ground relating for the alluvial deposits in the far southwest;
- Null / no data for collapsible deposits;
- Very low risk of running sand relating to the Glacial Till;
- Low risk of running sand for the alluvial deposits.

- 3.3.2 The ground stability hazards are likely to be attributed to the underlying natural geology and the surrounding topography of the site and as such are considered **not significant** to the future development of the site. However, future foundations should take account of the site specific ground conditions and whilst a negligible risk is recorded for compressible materials relating to the Glacial Till, there is potential for organic peaty materials to be present on site, associated with the ponds and land drain and watercourse. Organic peaty materials may have a high water content and are highly compressible in nature. Should any construction occur in the far southwest of the site, the potentially compressible nature of the alluvial deposits should also be considered.

3.4 Radon

- 3.4.1 Citing the BGS and Health Protection Agency (HPA), the GroundSure Report for the site indicates that the site is in a radon affected area, as between 1% and 3% of homes are above the residential action level. Consultation of BRE 211 – Radon, guidance on protection measures for new buildings indicates that radon protective measures are not required in the construction of new dwellings or extensions.
- 3.4.2 Radon gas is considered to be **not significant** in relation to the site's future development.

4.0 ENVIRONMENTAL SETTING

4.1 General

- 4.1.1 In reading the following sections, reference to the sensitivity plans reproduced from the GroundSure Report presented in Appendix B should be made. The information provided below has been sourced from the GroundSure Report and other information sources as detailed in Appendix A.

4.2 Hydrogeology

- 4.2.1 The Environment Agency's (EA) groundwater vulnerability map, Sheet 10, Central Lancashire and their web site indicates that the classification of the aquifer at the site and its environs as follows:

Table 4.1 Aquifer and Leachability Classification

Inferred Strata	Aquifer	Overlying Soil Leachability
Alluvial Deposits	Secondary A ⁽¹⁾	Low leaching potential
Clitheroe Limestone Formation & Hodder Mudstone Formation	Secondary A ⁽¹⁾	n/a

⁽¹⁾ Secondary A - permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as Minor Aquifers.

- 4.2.2 Information from the EA website indicates that the site is not located within, or within a 1km radius of, a groundwater Source Protection Zone (SPZ).
- 4.2.3 The Water Framework Directive (WFD) is European Legislation to ensure waters are managed to achieve good quality water across Europe. In the UK, the WFD is governed by the EA who is responsible for making plans to protect and improve lakes, rivers, groundwaters and coastal water habitats. Risk assessments of these water bodies are based on point and diffuse sources of pollution, water abstraction and flow regulation, physical and morphological alteration to water bodies and alien sources. Information from the EA website indicates that the current quantitative quality of the underlying and surrounding groundwaters is **good** and the current chemical quality is **good (deteriorating)**.
- 4.2.4 Information from the GroundSure Report indicates that there are no potable or non-potable groundwater abstractions, discharge consents or pollution incidents affecting groundwaters within the vicinity of the site.
- 4.2.5 On the basis of the available researched information groundwaters underlying the site and in the wider area are considered to be of **low to moderate sensitivity**.

4.3 Hydrology

- 4.3.1 The nearest surface water features have been identified from the site walkover inspection, current Ordnance Survey plans and the GroundSure Report. Table 4.2 summarises the distance and bearing of local surface water features from the site and their flow direction.

Table 4.2: Location of Surface Water Features

Surface Water Feature	Distance and Bearing from Site	Flow Direction
Ponds	On site (southern boundary)	n/a
Tributary of Pendleton Brook	On site (central)	north to south
River Ribble (main river)	On site (southwest)	north to south
Land drain to River Ribble	On site (north)	northeast to southwest
Land drain to River Ribble	On site (west), 20m west	east to west
Tributary of Pendleton Brook	150m south	northeast to southwest
Pendleton Brook	200m south	east to west
Mearley Brook	600m southeast	northeast to southwest
Barrow Clough (part culverted)	450m south	east to west
Bashall Brook	350m north	north to south

- 4.3.2 The General Quality Assessment scheme (GQA) is the EA's national method for classifying water quality in rivers and streams. The River Ribble was classified as Grade A (very good) and Grade B (good) for its chemical and biological quality, respectively in 2008 and all watercourses both on and off site ultimately feed the River Ribble. Under the WFD, the River Ribble is classified as having a moderate ecological quality and good chemical quality.
- 4.3.3 Information within the GroundSure Report indicates that there are three surface water abstraction licences recorded within a 1km radius of the site; one from the Mearley Brook located approximately 600m east of the site, and two from the Pendleton Brook located approximately 760m and 820m east-southeast of the site. Each of the abstractions is recorded for general use – transfer between sources.
- 4.3.4 There is one recorded discharge consent for the site, which was originally registered in 1995. This licence was revoked in 2009 and reissued. The existing licence is for storm overflow (sewage discharges) to the watercourse trending north to south through the central part of the site. There are five further licensed discharge consents for storm overflow – sewage discharges within a 500m radius of the site.
- 4.3.5 The GroundSure Report indicates that there is one pollution incident recorded on site which causes a Category 2 (significant) impact to the on site watercourse. The incident occurred in July 2006 and was as a result of crude sewage being discharged. Four off site pollution incidents occurred between 2002 and 2003 (within a 500m radius of the site), each resulting in a Category 3 (minor) impact. Three of the four incidents relate to discharges of soils / clay / suspended solids.
- 4.3.6 Surface waters are classified as being within a nitrate vulnerable zone by DEFRA.
- 4.3.7 Based on the researched information, surface waters in the proximity of the site are considered to be of **high sensitivity**.

4.4 Flood Risk

- 4.4.1 The EA flood maps indicate the majority of the site to be located in Flood Zone 1, which is outside of an EA mapped floodplain. Flood Zone 2 of the River Ribble extends marginally within the boundaries of the site in the far southwest. The tributary of the Pendleton Brook flowing north to south through the site may be susceptible to localised flooding, particularly during heavy rainfall events.
- 4.4.2 Information from the GroundSure Report indicates that there have been no recorded historic flood events on site, with the nearest recorded event of fluvial flooding from the River Ribble occurring on the 31 January 1995 approximately 230m northwest of the site at Edisford Bridge. Records indicate nineteen houses to have flooded by approximately 1inch to 3inches on the ground floor during this flood event. This same area is also shown to have flooded on the 1938 CS plan at 1:10,560 scale on 28 January 1931. This plan also indicated a further off site flood event to have occurred approximately 200m south of the site where the on site tributary converges with the Pendleton Brook, with a field annotated as 'surface of water on 28 January 1930'.
- 4.4.3 Data provided by the BGS within the GroundSure Report indicates the site to be located within a 50m radius of an area classified as being at high susceptibility to groundwater flooding. This is considered to relate to the alluvial deposits in the far southwest of the site.
- 4.4.4 Flooding is considered **not significant** to the future development of the site providing that the development takes account of the local surface waters and potential for shallow groundwater. A Flood Risk Assessment (FRA) will be required as part of the planning process and should consider the risk of flooding from the on site watercourses, groundwater, pluvial flooding (overland), artificial drainage systems and from infrastructure failure. Planning Policy Statement 25: Development and Flood Risk and the Environment Agency's (EA) Flood Risk Standing Advice should be consulted for further information.

4.5 Landfill and Waste Management Sites

- 4.5.1 Information provided within the GroundSure Report and on the EA and BGS websites, indicates there to be two landfill sites located within a 500m radius of the site.
- Henthorn Road Landfill Site, a historic and active landfill site located approximately 300m south of the site. The site is currently being operated by Sita (Lancashire) Limited and is licensed as a household, commercial and industrial landfill site. The historic EA records indicate that wastes were first accepted in 1920 and that it was operated by Clitheroe Metropolitan Borough Council for commercial and liquid/sludge waste (Difficult Landfill). The BGS record for this site indicates that the site does not present a risk to the aquifer.
 - Stalwart Dying Company Limited, a historic landfill site located approximately 400m east of the site. The historic EA records indicate that the waste types infilled are 'unknown'.

- 4.5.2 A potential risk from a landfill site is considered to be present when it is situated within a 250m radius of the site. Given the distance of the recorded landfills they are considered **not significant** to the future development of the site. However, it would be prudent as part of any future ground investigation works to undertake ground gas monitoring. An old quarry is located on site and whilst it does not appear to have been infilled, there is limited potential that some infilling may have occurred and this should be confirmed through intrusive ground investigation.
- 4.5.3 A special waste transfer station and civic amenity site (household waste disposal centre) also exists at Henthorn Road located from approximately 300m south of the site. The transfer station is also operated by Sita (Lancashire) Limited. Providing that the site is operated within the restrictions of its licence, it is considered **not significant** to the future development of the site.

4.6 Storage of Hazardous Substances and Authorisations

- 4.6.1 Notification of Installations Handling Hazardous Substances (NIHHS) Authorisations prohibits the handling of certain hazardous substances unless the Health and Safety Executive (HSE) has been notified. There are no recorded NIHHS authorisations recorded in the vicinity of the site, within the GroundSure Report.
- 4.6.2 The Control of Major Accident Hazards (COMAH) amendments came into force on 30 June 2005 replacing the previous COMAH 1999 regulations. These aim to prevent and mitigate the effects on people and the environment of those major incidents involving dangerous substances such as natural gas, oil or explosives (not exhaustive). There are no COMAH sites recorded in the vicinity of the site, within the GroundSure Report.
- 4.6.3 There are no historic IPC Authorisations or IPPC authorised activities recorded within a 500m radius of the site.

4.7 Ecology

- 4.7.1 There are no environmentally sensitive sites, for example, Site of Special Scientific Interest, Special Areas of Conservation, Nature Reserves etc, located within a 500m radius of the site.
- 4.7.2 Due to the presence of mature trees on site, enquiries with the Ribble Valley Borough Council have been made to determine if any of the trees on or near to the site were covered by a Tree Preservation Order (TPO). TPOs give legal protection to trees or woodland by preventing uprooting, topping, lopping, cutting down, wilful damage or destruction of trees, including cutting roots, without permission. The Countryside Services Officer at Ribble Valley Borough Council has been contacted and it has been confirmed that there are no TPOs recorded within the site boundaries. However, a TPO is present within the boundaries of an adjacent property; Alder Leeigh located immediately east of the site.
- 4.7.3 Should any trees be felled on site as part of the development, a tree felling licence from the Forestry Commission may be required.
- 4.7.4 Observations made during the site visit did not identify the presence of Japanese Knotweed, or any other invasive plants, on site.

4.8 Other Environmental Information

- 4.8.1 Information within the GroundSure Report indicates that the site has not been determined as contaminated land under the Environmental Protection Act 1990. There are no sites designated as contaminated land within a 500m radius of the site.

5.0 CONCEPTUAL SITE MODEL AND QUALITATIVE RISK ASSESSMENT

5.1 In the UK, the currently adopted method of assessment of potential contamination risk is to consider contamination in terms of **source, pathway and receptor**, thus deriving a conceptual model for the site. This method is broadly termed as a 'risk assessment' approach. The first stage in such an assessment is to identify whether a potential source exists as a result of the presence of contaminated soil, groundwater or ground gas beneath the site or neighbouring sites. The second step is to identify sensitive receptors to such contamination and finally, the third stage identifies how such sources of contamination might be transferred, via a specific pathway to identified receptors, either on, or in the vicinity of the site. Consequently, the possible risk posed can be considered.

5.2 Based on the researches undertaken using historical plans of the site, the site walkover inspection and from other information sources, the following are considered to be potential historic and present **on site sources** of contamination.

- Made Ground materials most likely comprising reworked natural materials from agricultural activities, with the potential for inert construction/demolition materials from the development of surrounding roads and residential properties to the northeast of the site. Limited contamination of these materials may be present from agricultural machinery i.e. fuel and oil hydrocarbons etc;
- Various land drains, ponds and areas of marshland – localised organic peaty materials producing ground gases;
- Old Quarry, limited potential for infilled materials to be present;
- Pesticides and herbicides from agricultural land usage.

5.3 The potential **off site sources** of contamination, either historic, recent or current, possibly affecting the site are considered to include:

- Made Ground materials most likely comprising reworked natural materials from agricultural activities, with the potential for inert construction/demolition materials from the development of surrounding roads and residential properties to the northeast and southeast of the site. Some contamination of these materials may be present i.e. heavy metals, fuel and oil hydrocarbons, PAHs etc;
- Spreading of sewage sludge across agricultural land, potential for elevated heavy metals and other inorganic compounds;
- Refuse Destructor, potential for elevated heavy metals and other inorganic compounds in ash, fuel and oil hydrocarbons, potential for PCBs, asbestos;
- Household Waste Disposal Centre, potential for fuel and oil hydrocarbons;
- Operational landfill site located from 300m south and 400m east of the site – potential migration of ground gases and leachate;
- Various land drains, watercourses and ponds – localised organic peaty materials producing ground gases.

- 5.4 It is understood that the site is to be developed for a residential end use. The potential **receptors** to the identified contamination sources described above are considered to be:
- Construction workers;
 - Future residents;
 - Neighbouring site users;
 - Controlled waters (groundwater and surface waters) of low to moderate and high sensitivities.
- 5.5 The potential **pathways** linking the identified probable contamination **sources** and the **receptors** are considered to be:
- Direct contact with any contaminated soils, standing water or groundwater;
 - Surface water run-off via land to on site watercourses and ponds;
 - Leaching of elements and compounds from soils and their mobilisation to the underlying Secondary A aquifer (particularly where alluvial deposits are present in the southwest of the site);
 - Leaching of elements and compounds from soils and their mobilisation to on site surface waters and as baseflow via the Secondary A aquifer;
 - Dust and vapour inhalation (outdoor air and/or the indoor air of buildings constructed as part of the development);
 - Migration of landfill leachate and ground gases onto site from off site landfill (minimal risk given the distance of the identified landfill site);
 - Ingestion of contaminated home grown vegetables.
- 5.6 On the basis of the researched information, it is considered from the above that there are limited potentially complete **source, pathway, receptor linkages** at the site, whether in its current state or as a newly developed residential site.
- 5.7 The current and future risk to site users and construction workers from contamination from on site sources is considered to be **low**.
- 5.8 On the basis of groundwater and surface water sensitivities, environmental setting and previous site use; the environmental risk from the site is considered to be **low**.
- 5.9 A **low to moderate risk** to site users is considered to be present on site from ground gases. This is largely as a result of the numerous land drains and ponds on site and bordering the site, with the potential for organic peaty materials producing methane.

6.0 GEOTECHNICAL AND OTHER CONSIDERATIONS

- 6.1 The BGS records Glacial Till deposits on site, underlain by the Clitheroe Limestone Formation & Hodder Mudstone Formation. A localised area of alluvial deposits is recorded in the far southwest of the site adjacent to the River Ribble. A limited thickness of Made Ground deposits are also anticipated on site and based upon the site walkover and BGS supplied information and historic records they are likely to comprise reworked natural materials from agricultural activities, with the potential for inert construction/demolition materials. The presence, location and thicknesses of these strata should be confirmed by intrusive ground investigation to assist with foundation and pavement design, together with determining the strength and maximum bearing capacities of each stratum.
- 6.2 Shallow foundations within the superficial deposits may be possible depending upon the thickness of Made Ground across the site; the volume change potential of the natural and Made Ground should be determined.
- 6.3 Some compressible organic peaty materials may be present in the vicinity of the on site ponds and land drains. Dependant upon the proposed development layout and use of the existing watercourses within the development, it may be necessary to undertake some dewatering activities and/or the removal of compressible materials (if identified as present through intrusive investigation). In the worst case scenario it could mean that piled foundations are necessary below parts of the development including other measures to ensure that external areas of the development are not surcharged where they lie above peat deposits.
- 6.4 A public right of way is present along the River Ribble in the southwest of the site and this will need to be maintained during and upon development.

7.0 CONCLUSIONS

- 7.1 The site has historically comprised open fields, as present day, used for agricultural purposes. The site is located off Henthorn Road southwest of the town of Clitheroe.
- 7.2 A layer of Made Ground (reworked natural materials, with the potential for some inert construction demolition materials) is anticipated across the site. BGS published information indicates superficial deposits of Glacial Till to be present across the entire site, with alluvial deposits present in the far southwest, adjacent to the River Ribble. The man made and natural superficial deposits will be underlain by the Carboniferous aged Clitheroe Limestone Formation and Hodder Mudstone Formation. Shallow foundations are likely to be suitable within the natural superficial deposits depending upon the required loadings and thicknesses and nature of Made Ground deposits.
- 7.3 A small quarry was present in the northeast of the site during the late 1800s and occupied an area of approximately 18m by 18m. The quarry still remains on site and does not appear to have been infilled, observed to be approximately 1.5m deep. Coal mining and mineral extraction activities on and off site are considered **not significant** to the development of the site. However, consideration to the development of the site will need to be given surrounding the 'old quarry'.
- 7.4 The surface ground stability hazards are considered to be **not significant** to the future development of the site. However, the future foundations should take account of the site specific ground conditions particularly should any organic peaty materials be identified on site or should any development occur in the area where alluvial deposits are recorded, as these materials may be compressible in nature. Any potentially organic peaty materials also pose a **low to moderate risk** to the site from ground gas production (particularly methane).
- 7.5 Radon gas, COMAH & NIHHS consents, pollution prevention control authorisations and oil/fuel pipelines are all considered **not significant** to the future development of the site.
- 7.6 The alluvial deposits and underlying Clitheroe Limestone Formation and Hodder Mudstone Formation are classified by the EA as Secondary A aquifers. The site does not lie within a groundwater Source Protection Zone, and there are no recorded abstractions or discharge consents within the vicinity of the site. Groundwaters underlying and surrounding the site are considered to be of **low to moderate sensitivity** and at **low risk** from contamination on site.
- 7.7 The River Ribble trends and flows in a southerly direction in the southwest of the site and the Pendleton Brook tributary (part culverted) trends north to south through Field 3. Two land drains, discharging to the River Ribble, are also present in the west and northwest of the site together with two ponds located on the western half of southern 'v' shaped site boundary. There are no recorded abstractions from surface waters on site. However, there is one discharge consent and one pollution incident recorded for the site. Surface waters are considered to be of **high sensitivity** (give the proximity of the River Ribble, a main river) and at **low risk** from contamination on site.

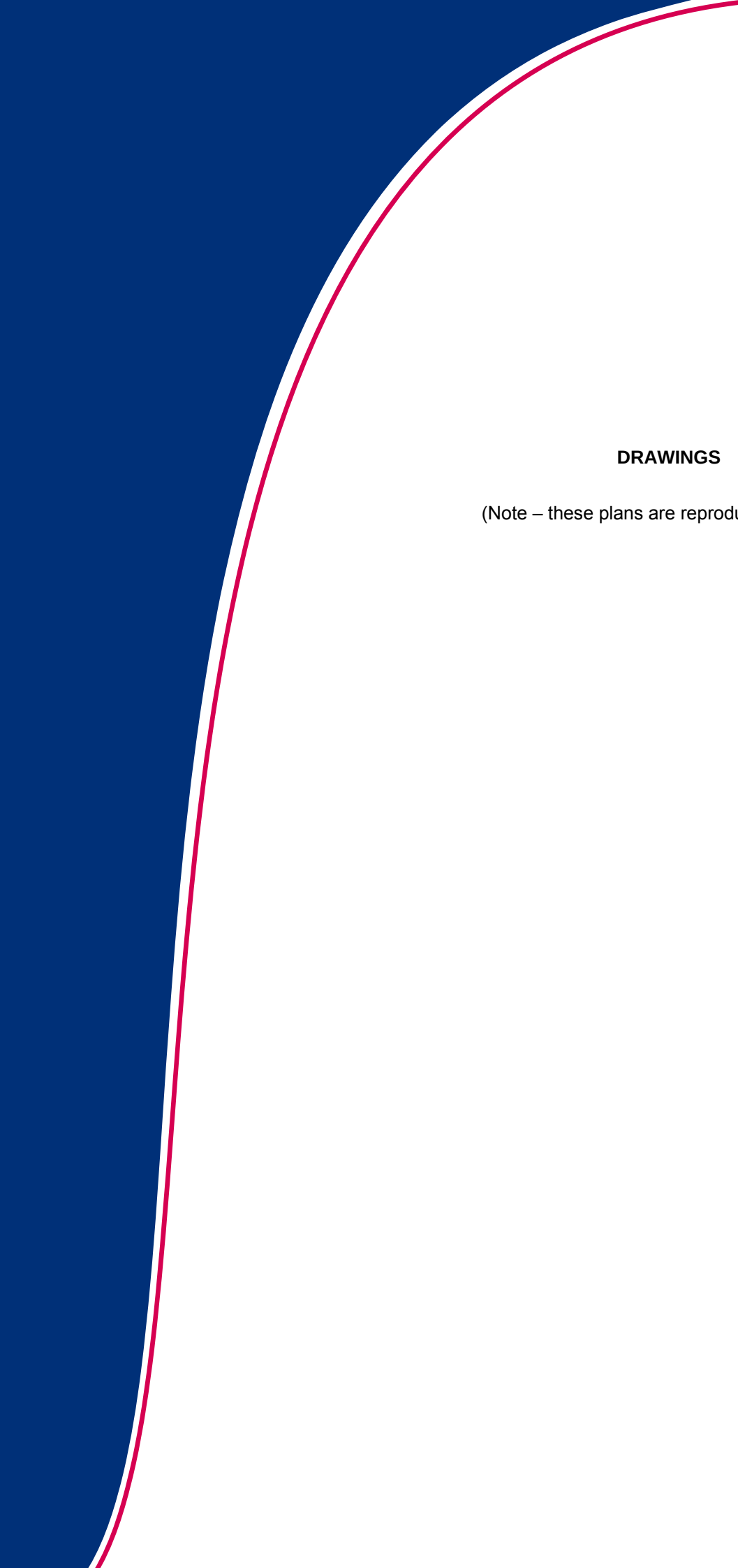
- 7.8 The main part of the site is located within the EA Flood Zone 1 with regard to fluvial flooding, which is outside of an EA mapped flood plain. Flood Zone 2 of the River Ribble extends marginally within the boundaries of the site in the far southwest. Localised flooding may occur on site, associated with the tributary of the Pendleton Brook and local land drains and ponds. The alluvial deposits mapped in the far southwest of the site are recorded as being at high susceptibility to groundwater flooding. Flooding is considered **not significant** to the future development of the site providing that the development takes account of the local surface waters and potential for shallow groundwater.
- 7.9 Two landfill sites are located within a 500m radius of the site but are greater than 250m away. As such they are considered **not significant** to the future development of the site. An old quarry is located on site and whilst it does not appear to have been infilled, there is limited potential that some infilling may have occurred. A Household Waste Disposal Centre is also located at the same site of the landfill 300m south of the site and providing that the site is operated within the restrictions of its licence, it is considered **not significant** to the future development of the site.
- 7.10 There are no environmentally sensitive sites within a 500m radius of the site and observations made during the site visit did not identify the presence of Japanese Knotweed, or any other invasive plants, on site. There are no TPOs for any of the mature trees on site; however, the Countryside Services Officer at Ribble Valley Borough Council has confirmed that there is a TPO within the boundaries of an adjacent property; Alder Leigh located immediately east of the site.
- 7.11 There are no sites designated as contaminated land within a 500m radius of the site and on the basis of the researched information indicating the former use of the site and the environmental setting, it is considered that from potential contamination there is a **low risk** to the future site users and construction workers.

8.0 RECOMMENDATIONS

- 8.1 A Flood Risk Assessment will be required in accordance with the requirements of Planning Policy Statement 25: Development and Flood Risk.
- 8.2 Prior to the development of the site, it is recommended that a suitably designed intrusive geotechnical ground investigation is carried out to confirm the anticipated ground conditions at the site. Particular attention should be paid to the extent of Made Ground, the bearing capacities and plasticity of the founding strata, their capacity to shrink and swell, and their permeability (to specifically aid with surface water drainage proposals). The presence of compressible organic peaty materials should also be confirmed as part of the geotechnical investigation. Furthermore the investigation should aim to confirm that the area of the old quarry has not been infilled.
- 8.3 It is recommended that a baseline environmental investigation is carried out, at the same time as the geotechnical investigation, in line with current best practices. A broad suite of soil analysis should be carried out and this should also be designed to assist with concrete classification and the degree of protection required for water supply pipes. The environmental ground investigation should also aim to determine the water quality of the underlying aquifer and the presence of any shallow perched groundwaters encountered within the Glacial Till.
- 8.4 As a result of the presence of potential organic peaty materials on site, associated with the on site land drains and ponds and to a lesser degree the presence of an off site landfill sites, it is recommended that a programme of ground gas monitoring is carried out in line with current best practices. This should aim to determine the actual risk to the proposed development from the potential migration of ground gases onto the site from off site sources and the migration of ground gases from the on site sources i.e. peaty materials.
- 8.5 It would be prudent to consult further with Local Authority Contaminated Land Officer prior to the commencement of any intrusive ground investigation works, to ensure that the investigation is appropriately designed and will satisfy any planning conditions.

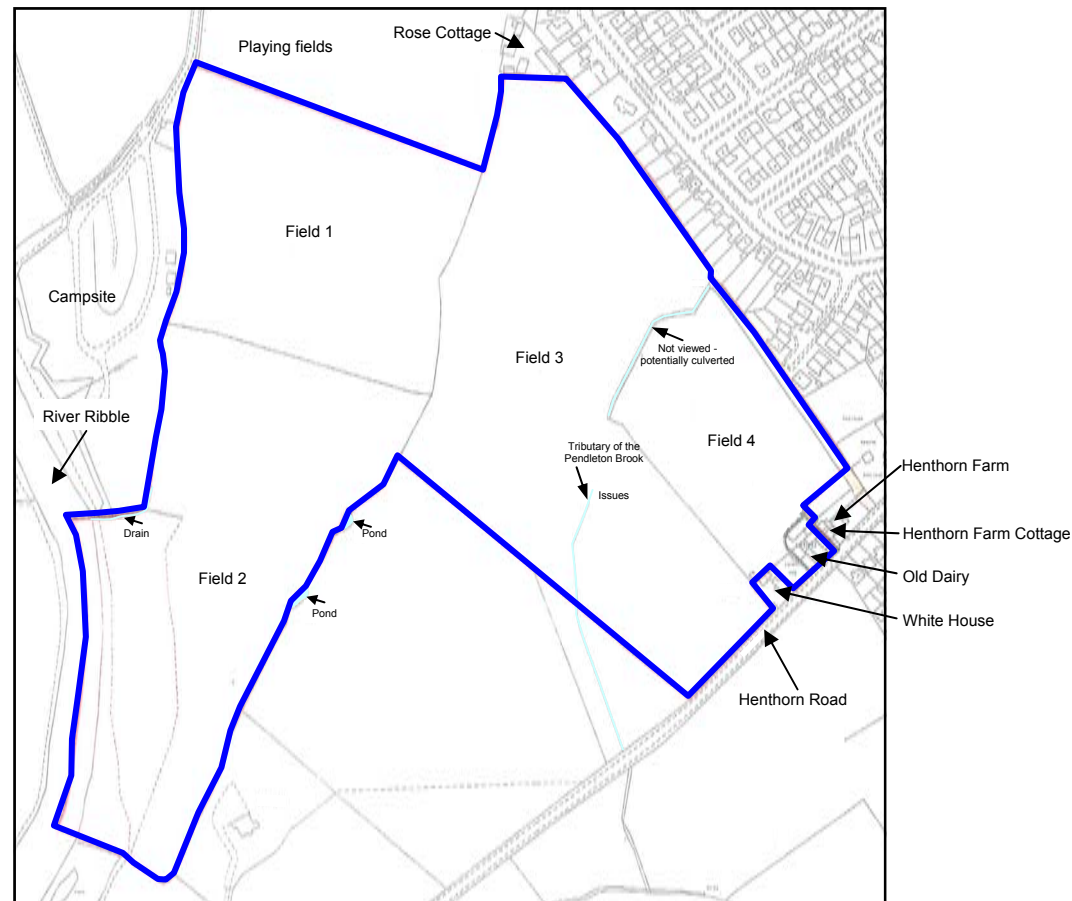
9.0 GENERAL

- 9.1 Whilst confident in the findings of our report we are unable to give an assurance that they will be accepted by the authorities without question. We therefore advise that where appropriate our report and associated matters are submitted to approving bodies and approval obtained or sought before detailed design, site works or other irrevocable action is embarked upon.
- 9.2 The recommendations contained in this report do not constitute any form of specification for the undertaking of the works required.
- 9.3 The conclusions reached in this report are necessarily restricted to those that can be determined from the information consulted and may be subject to amendment in the light of additional information becoming available.
- 9.4 This report has been prepared for the sole use of the specified client in the intended context stated above. It should not be relied upon or used for any other project or by any other party without written authority from Johnson Poole and Bloomer Limited.
- 9.5 The copyright in this report is owned by Johnson Poole and Bloomer Limited and may not be reproduced, published or adapted without their written permission. Subject to satisfaction of copyright conditions required by the Ordnance Survey, GroundSure and any other third party supplied information complete copies of this report may be made and distributed by the client as an expedient in dealing with matters directly related to its commission.



DRAWINGS

(Note – these plans are reproduced in colour)



Key -

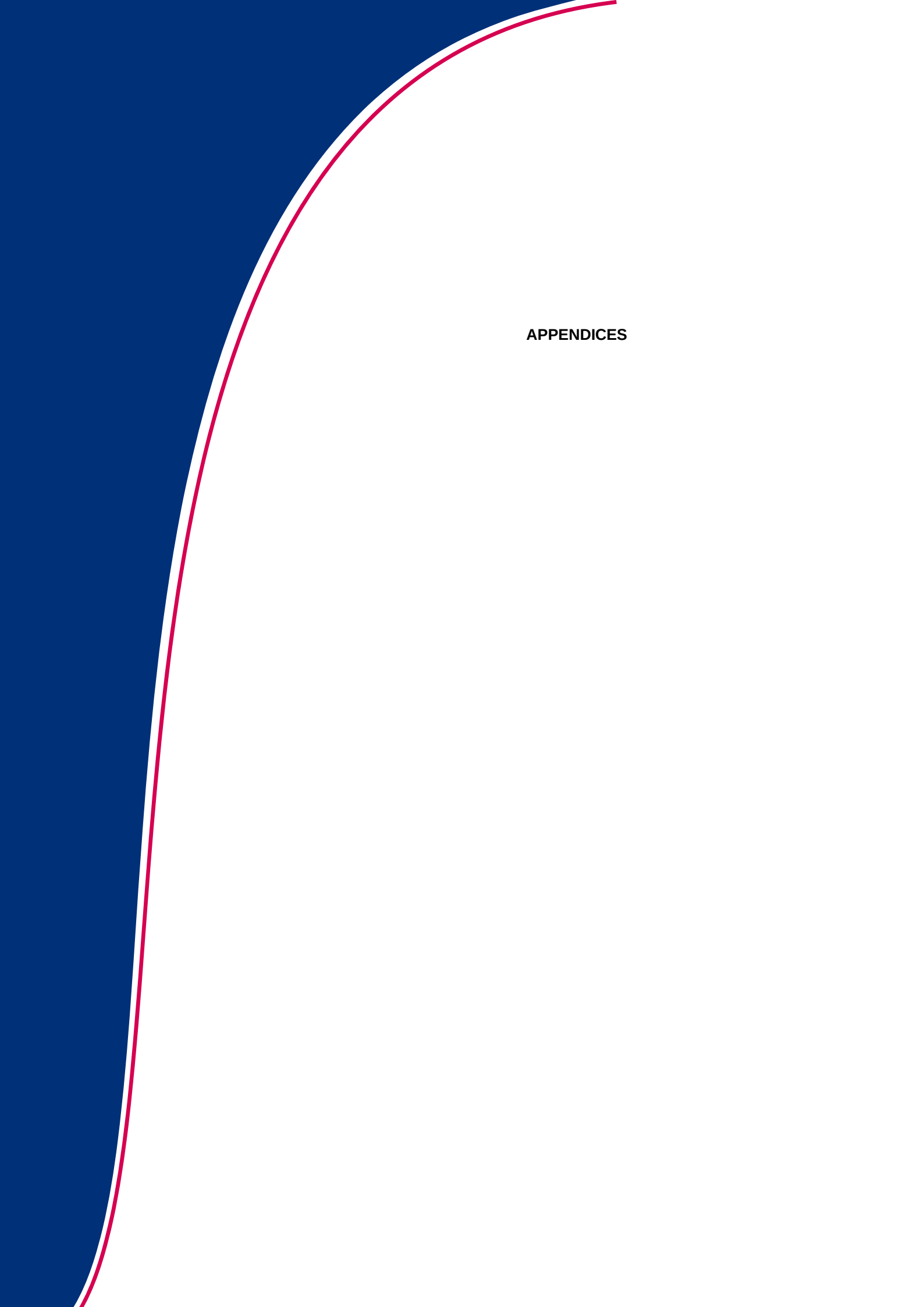
 Approximate Study Boundary

**JOHNSON
POOLE &
BLOOMER**
CONSULTANTS

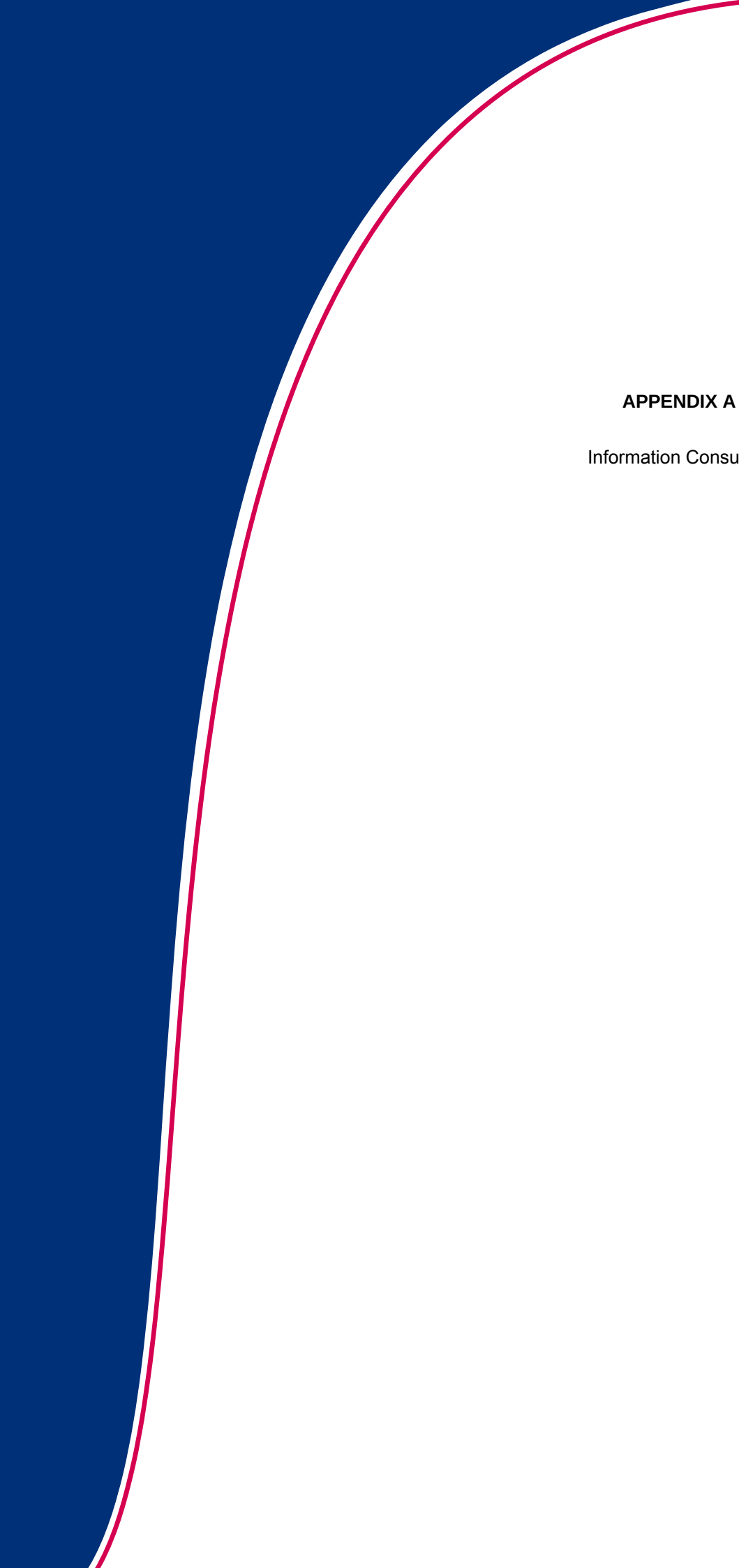


Engineer GP	Client GLADMAN DEVELOPMENTS LTD		Title STUDY BOUNDARIES & LAYOUT
Checked HB	Project HENTHORN ROAD, CLITHEROE		
Approved AES	Date 28/05/10	Scale N.T.S	Drawing KB450/01

This Plan is based upon the Ordnance Survey Map with the sanction of the Controller of H.M. Stationery Office. Crown Copyright AL 100002652.



APPENDICES



APPENDIX A

Information Consulted

INFORMATION CONSULTED:

In preparation of this report, the following information has been consulted:

General

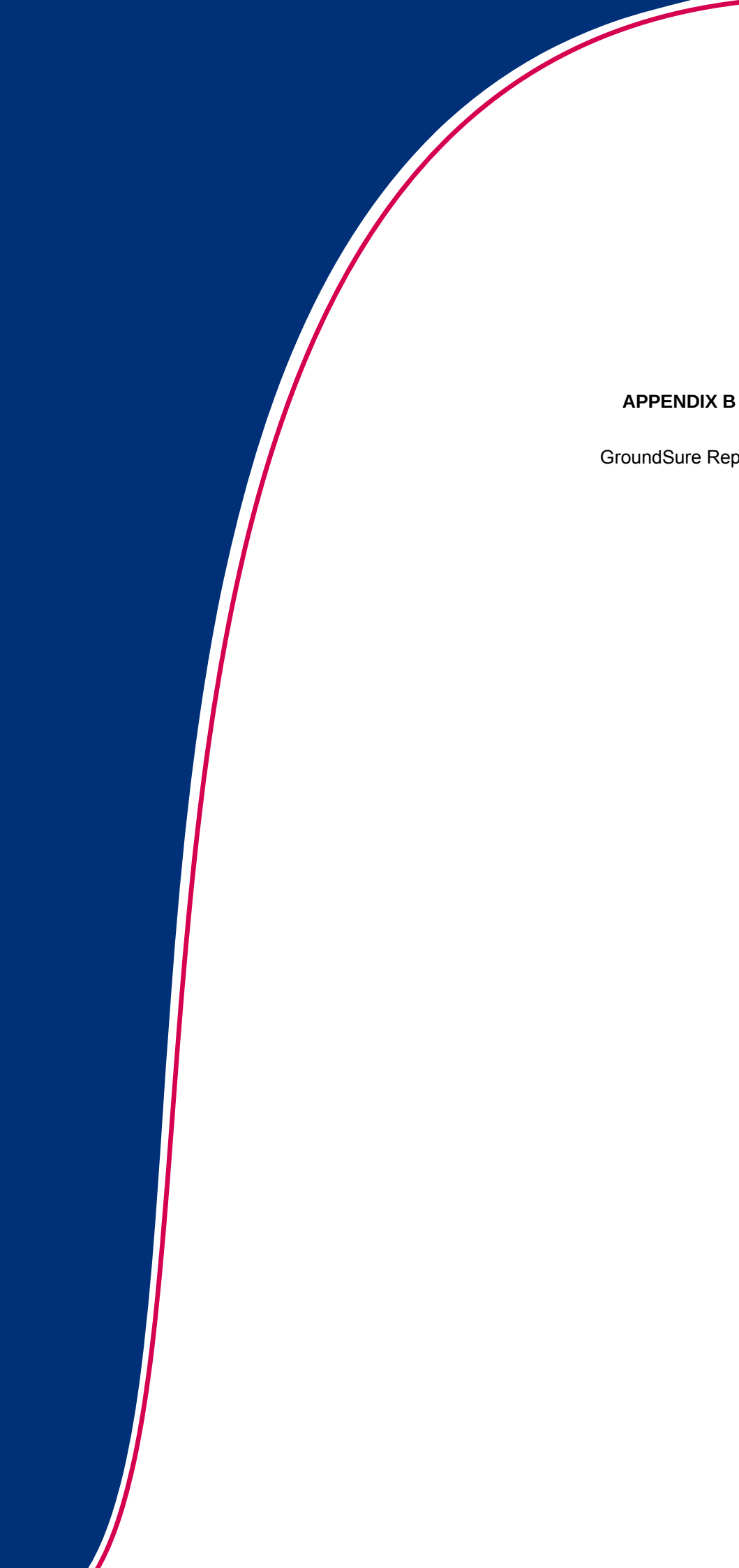
- JPB archives
- Historical Ordnance Survey Plans
- The Coal Authority Gazetteer and the Law Society's Guidance Notes (2006)
- PPS25: Development and Flood Risk
- Environment Agency Flood Risk Standing Advice

Environmental Setting

- GroundSure Report (EnviroInsight, GeoInsight and FloodInsight) dated 2 June 2010 and referenced CMAPS-843213, CMAPS-843214 and CMAPS-844237;
- British Geological Survey, Sheet 65, 1:50,000 scale (solid and drift geology);
- Department of the Environment (1991) "Review of Mining Instability in Great Britain";
- Environment Agency website - <http://www.environment-agency.gov.uk>;
- MAGIC web site – <http://www.magic.gov.uk/website/magic>;
- Linesearch Website – <http://www.linesearch.org/>.

Contamination Qualitative Risk Assessment

- CIRIA (1995) CLR6 "Prioritisation and Categorisation Procedure for Sites which may be Contaminated"
- CIRIA (2001) C552 "Contaminated Land Risk Assessment: A Guide to Good Practice"
- DETR (2000) "Guidelines for Environmental Risk Assessment and Management"
- Department of Environment Industry Profiles
- Environment Agency (2000) "Guidance for the Safe Development of Housing on Land Affected by Contamination" R & D Publication 66
- Environment Protection Act 1990: Part IIA Contaminated Land



APPENDIX B

GroundSure Report

CENTREMAPS
Brockamin House, Leigh,
, WR6 5JU

GroundSure Reference:	CMAPS-843213
Your Reference:	Henthorn Road
Report Date:	Jun 2, 2010
Report Delivery Method:	Email - pdf
Client Email:	andy@centremaps.com

GroundSure EnviroInsight

Address: Henthorn Road, Clitheroe

Dear Sir/Madam,

Thank you for placing your order with CENTREMAPS. Please find enclosed the GroundSure EnviroInsight as requested

If you need any further assistance, please do not hesitate to contact our helpline on 01886 832972 quoting the above CENTREMAPS reference number.

Yours faithfully,

CENTREMAPS

Enc.
GroundSure EnviroInsight

GroundSure EnviroInsight

Address: Henthorn Road, Clitheroe

Date: Jun 2, 2010

GroundSure Reference: CMAPS-843213

Your Reference: Henthorn Road

Client: CENTREMAPS



Brought to you by CENTREMAPS

Aerial Photograph of Study Site



Site Name: Henthorn Road, Clitheroe
Grid Reference: 372944,440980
Size of Site: 16.35 ha

Aerial photography supplied by Getmapping PLC.
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Overview of Findings

For further details on each dataset, please refer to each individual section in the main report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Report Section	Number of records found within (X) m of the study site boundary					
1. Environmental Permits, Incidents and Registers	on-site	0-50	51-250	251-500	501-1000	1000-1500
1.1 Industrial Sites Holding Environmental Permits and/or Authorisations						
Records of historic IPC Authorisations	0	0	0	0	-	-
Records of Part A(1) and IPPC Authorised Activities	0	0	0	0	-	-
Records of Water Industry Referrals (potentially harmful discharges to the public sewer)	0	0	0	0	-	-
Records of Red List Discharge Consents (potentially harmful discharges to controlled waters)	0	0	0	0	-	-
Records of List 1 Dangerous Substances Inventory sites	0	0	0	0	-	-
Records of List 2 Dangerous Substances Inventory sites	0	0	0	0	-	-
Records of Part A(2) and Part B Activities and Enforcements	0	0	0	0	-	-
Records of Category 3 or 4 Radioactive Substances Authorisations	0	0	0	0	-	-
Records of Licensed Discharge Consents	2	0	1	8	-	-
Records of Planning Hazardous Substance Consents and Enforcements	0	0	0	0		
1.2 Records of COMAH and NIHHS sites	0	0	0	0	-	-
1.3 Environment Agency Recorded Pollution Incidents						
National Incidents Recording System, List 2	1	0	4	-	-	-
National Incidents Recording System, List 1	0	0	0	-	-	-
1.4 Sites Determined as Contaminated Land under Part IIA EPA 1990	0	0	0	0	-	-
2. Landfill and Other Waste Sites	on-site	0-50	51-250	251-500	501-1000	1000-1500
2.1 Landfill Sites						
Environment Agency Registered Landfill Sites	0	0	0	1	0	-
Landfill Data – Operational Landfill Sites	0	0	0	1	0	-
Environment Agency Historic Landfill Sites	0	0	0	2	1	0
Landfill Data – Non-Operational Landfill Sites	0	0	0	1	0	-
BGS/DoE Landfill Site Survey	0	0	0	0	1	0
GroundSure Local Authority Landfill Sites Data	0	0	0	1	0	0
2.2 Landfill and Other Waste Sites Findings						
Operational Waste Treatment, Transfer and Disposal Sites	0	0	1	0	-	-
Non-Operational Waste Treatment, Transfer and Disposal Sites	0	0	0	1	-	-
Environment Agency Licensed Waste Sites	0	0	0	1	8	0

3. Current Land Uses	on-site	0-50	51-250	251-500	501-1000	1000-1500
3.1 Current Industrial Sites Data	0	0	7	-	-	-
3.2 Records of Petrol and Fuel Sites	0	0	0	1	-	-
3.3 Underground High Pressure Oil and Gas Pipelines	0	0	0	0	-	-

4. Geology	Description
4.1 Are there any records of Artificial Ground and Made Ground present beneath the study site? *	No
4.2 Are there any records of Superficial Ground and Drift Geology present beneath the study site? *	Yes
4.3 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
Source: Scale: 1:50,000 BGS Sheet 068	

* This includes an automatically generated 50m buffer zone around the site.

5. Hydrogeology and Hydrology	on-site	0-50	51-250	251-500	501-1000	1001-2000
5.1 Environment Agency Groundwater Vulnerability and Soil Classification						
Is a Minor Aquifer present on site?	Yes	-	-	-	-	-
Is a Major Aquifer present on site?	No	-	-	-	-	-
Are there any Soil Classification records present on site?	Yes	-	-	-	-	-
5.2 Groundwater Abstraction Licences (within 1000m of the study site).	0	0	0	0	0	-
5.3 Surface Water Abstraction Licences (within 1000m of the study site).	0	0	0	0	8	-
5.4 Potable Water Abstraction Licences (within 2000m of the study site).	0	0	0	0	0	0
5.5 Are there any Source Protection Zones within 500m of the study site?	No					
5.6 River Quality	on-site	0-50	51-250	251-500	501-1000	1001-1500
Is there any Environment Agency information on river quality within 500m of the study site?	No	No	No	Yes	Yes	No
5.7 Detailed River Network entries within 500m of the site	7	3	8	4	-	-
5.8 Surface water features within 250m of the study site	Yes	Yes	Yes	-	-	-

6. Flooding	
6.1 Are there any Environment Agency indicative Zone 2 floodplains within 250m of the study site?	Yes
6.2 Are there any Environment Agency indicative Zone 3 floodplains within 250m of the study site?	Yes
6.3 Are there any Flood Defences within 250m of the study site?	No
6.4 Are there any areas benefiting from Flood Defences within 250m of the study site?	No
6.5 Are there any areas used for Flood Storage within 250m of the study site?	No
6.6 What is the maximum BGS Groundwater Flooding susceptibility within 50m of the study site?	High
6.7 What is the BGS confidence rating for the Groundwater Flooding susceptibility areas?	Moderate

7. Designated Environmentally Sensitive Sites	on-site	0-50	51-250	251-500	501-1000	1001-1500
7.1 Records of Sites of Special Scientific Interest (SSSI)	0	0	0	0	-	-
7.2 Records of National Nature Reserves (NNR)	0	0	0	0	-	-
7.3 Records of Local Nature Reserves (LNR)	0	0	0	0	-	-
7.4 Records of Special Areas of Conservation (SAC)	0	0	0	0	-	-
7.5 Records of Special Protection Areas (SPA)	0	0	0	0	-	-
7.6 Records of Ramsar sites	0	0	0	0	-	-
7.7 Records of World Heritage Sites	0	0	0	0	-	-
7.8 Records of Environmentally Sensitive Areas	0	0	0	0	-	-
7.9 Records of Areas of Outstanding Natural Beauty (AONB)	0	0	0	0	-	-
7.10 Records of National Parks	0	0	0	0	-	-
7.11 Records of Nitrate Sensitive Areas	0	0	0	0	-	-
7.12 Records of Nitrate Vulnerable Zones	1	0	0	0	-	-

8. Natural Hazards

8.1 What is the maximum risk of natural ground subsidence? Moderate

9. Mining

9.1 Are there any coal mining areas within 75m of the study site? No

9.2 What is the risk of subsidence relating to shallow mining within 150m of the study site? Negligible

9.3 Are there any brine affected areas within 75m of the study site? No

Using this Report

The following report is designed by Environmental Consultants for Environmental Professionals bringing together the most up-to-date market leading environmental data. This report is provided under and subject to the Terms & Conditions agreed between GroundSure and the Client. The document contains the following sections:

1. Environmental Permits, Incidents and Registers

Provides information on Regulated Industrial Activities and Pollution Incidents as recorded by Regulatory Authorities, and sites determined as Contaminated Land. This search is conducted using radii up to 500m.

2. Landfills and Other Waste Sites

Provides information on landfills and other waste sites that may pose a risk to the study site. This search is conducted using radii up to 1500m.

3. Current Land Uses

Provides information on current land uses that may pose a risk to the study site in terms of potential contamination from activities or processes. These searches are conducted using radii of up to 500m. This includes information on potentially contaminative industrial sites, petrol stations and fuel sites as well as high pressure underground oil and gas pipelines.

4. Geology

Provides information on artificial and superficial deposits and bedrock beneath the study site.

5. Hydrogeology and Hydrology

Provides information on groundwater vulnerability, soil leaching potential, abstraction licenses, Source Protection Zones (SPZ) and river quality. These searches are conducted using radii of up to 2000m.

6. Flooding

Provides information on surface water flooding, flood defences, flood storage areas and groundwater flood areas. This search is conducted using radii of up to 250m.

7. Designated Environmentally Sensitive Sites

Provides information on the Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR), Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, Local Nature Reserves (LNR), Areas of Outstanding Natural Beauty (AONB), National Parks (NP), Environmentally Sensitive Areas, Nitrate Sensitive Areas, Nitrate Vulnerable Zones and World Heritage Sites. These searches are conducted using radii of up to 500m.

8. Natural Hazards

Provides information on a range of natural hazards that may pose a risk to the study site. These factors include natural ground subsidence.

9. Mining

Provides information on areas of coal and shallow mining.

10. Contacts

This section of the report provides contact points for statutory bodies and data providers that may be able to provide further information on issues raised within this report. Alternatively, GroundSure provide a free Technical Helpline (08444 159000) for further information and guidance.

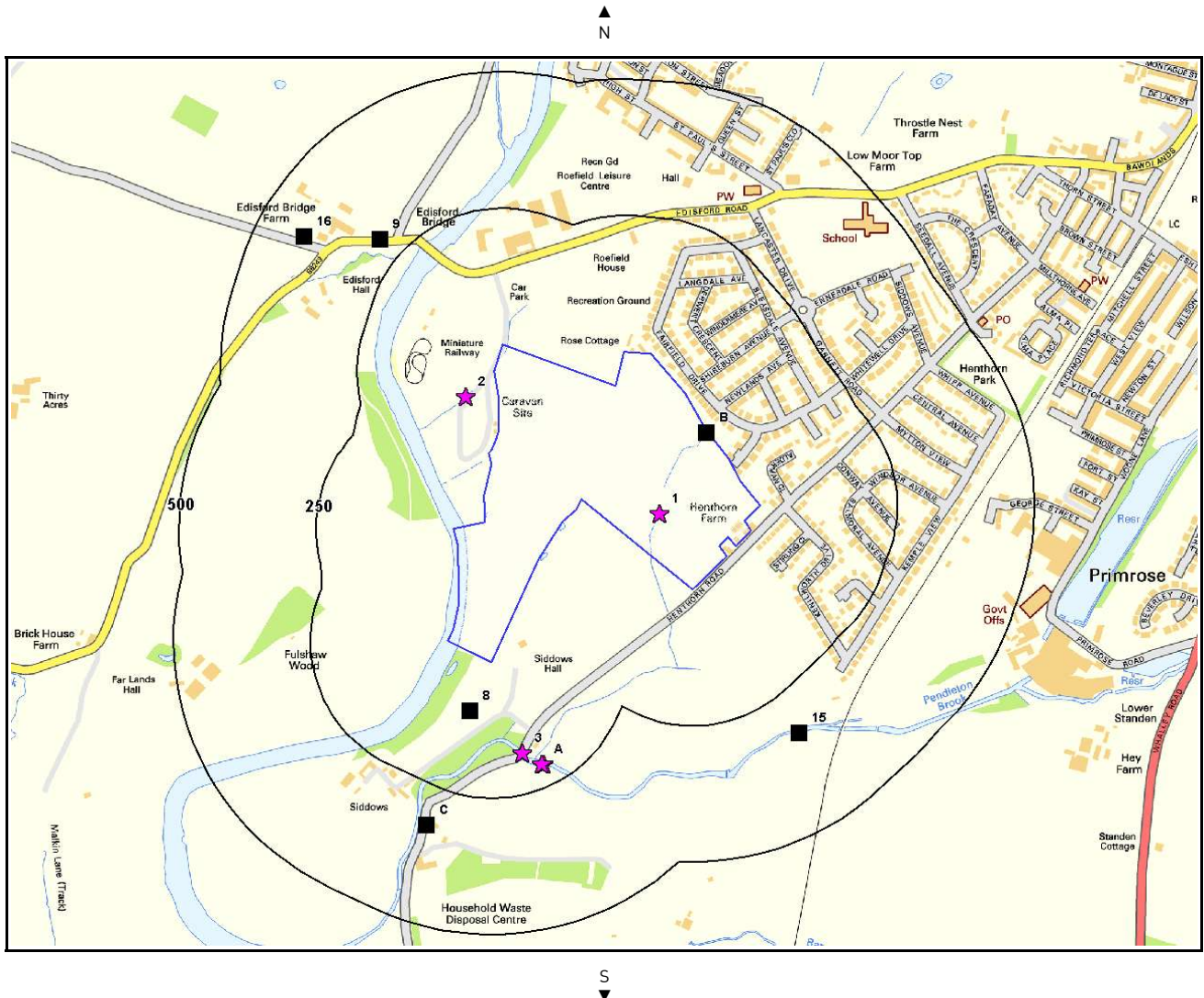
Note: Maps

Only certain features are placed on the maps within the report. All features represented on maps found within this search are given an identification number. This number identifies the feature on the mapping and correlates it to the additional information provided below. This identification number precedes all other information and takes the following format -Id: 1, Id: 2, etc. Where numerous features on the same map are in such close proximity that the numbers would obscure each other a letter identifier is used instead to represent the features. (e.g. Three features which overlap may be given the identifier "A" on the map and would be identified separately as features 1A, 3A, 10A on the data tables provided).

Where a feature is reported in the data tables to a distance greater than the map area, it is noted in the data table as "Not Shown".

All distances given in this report are in Metres (m). Directions are given as compass headings such as N: North, E: East, NE: North East from the nearest point of the study site boundary.

1. Environmental Permits, Incidents and Registers Map



Authorisations, Incidents and Registers Legend

Enabled by  Ordnance Survey

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- | | | |
|--|---|--|
|  Site Outline |  Recorded Pollution Incident |  RAS 3 & 4 Authorisations |
|  Search Buffers (m) |  Dangerous Substances (List 1) |  Part A(1) Authorised Processes and Historic IPC Authorisations |
| |  Dangerous Substances (List 2) |  Part A(2) and Part B Authorised Processes |
| |  Water Industry Referrals |  COMAH / NIHHS Sites |
| |  Licenced Discharge Consents |  Sites Determined as Contaminated Land |
| |  Red List Discharge Consents |  Hazardous Substance Consents and Enforcements |

1.Environmental Permits, Incidents and Registers

1.1 Industrial Sites Holding Licences and/or Authorisations

Searches of information provided by the Environment Agency and Local Authorities reveal the following information:

Records of historic IPC Authorisations within 500m of the study site: 0

Database searched and no data found.

Records of Part A(1) and IPPC Authorised Activities within 500m of the study site: 0

Database searched and no data found.

Records of Water Industry Referrals (potentially harmful discharges to the public sewer) within 500m of the study site: 0

Database searched and no data found.

Records of Red List Discharge Consents (potentially harmful discharges to controlled waters) within 500m of the study site: 0

Database searched and no data found.

Records of List 1 Dangerous Substances Inventory Sites within 500m of the study site: 0

Database searched and no data found.

Records of List 2 Dangerous Substance Inventory Sites within 500m of the study site: 0

Database searched and no data found.

Records of Part A(2) and Part B Activities and Enforcements within 500m of the study site: 0

Database searched and no data found.

Records of Category 3 or 4 Radioactive Substance Licences within 500m of the study site: 0

Database searched and no data found.

Records of Licensed Discharge Consents within 500m of the study site: 11

The following Licensed Discharge Consents records are represented as points on the Authorisations, Incidents and Registers map:

ID	Distance	Direction	NGR	Details	
6B	0.0	On Site	373130, 441110	Address: Adj Police Stn King St, Clitheroe, Lancashire Effluent Type: Sewage Discharges - Sewer Storm Overflow - Water Company Permit Number: 01RIB0002 Permit Version: 1	Receiving Water: S.w. Sys(dual Mh) Status: Post Nra Legislation Where Issue Date > 31-aug-89 (historic Only) Issue date: - Effective Date: 1/1/1995 Revocation Date: 13/4/2009
7B	0.0	On Site	373130, 441110	Address: Adj Police Stn King St, Clitheroe, Lancashire Effluent Type: Sewage Discharges - Sewer Storm Overflow - Water Company Permit Number: 01RIB0002 Permit Version: 2	Receiving Water: S.w. Sys(dual Mh) Status: Post Nra Legislation Where Issue Date > 31-aug-89 (historic Only) Issue date: 14/4/2009 Effective Date: 14/4/2009 Revocation Date: -
8	98.0	SW	372700, 440600	Address: North West Henthorn Rd Eo, North West Henthorn Road, Bridge Henth, Ribble Valley, Lancashire Effluent Type: Sewage Discharges - Sewer Storm Overflow - Water Company Permit Number: 017160099 Permit Version: 1	Receiving Water: Pendleton Brook Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: - Effective Date: 7/9/1983 Revocation Date: -
9	296.0	NW	372535, 441464	Address: Stp Serving Edisford Bridge Hotel, Edisford Bridge, Clitheroe, Lancashire, BB7 3LJ Effluent Type: Sewage Discharges - Final/treated Effluent - Not Water Company Permit Number: NPSWQD008210 Permit Version: 1	Receiving Water: A Drain Leading To The Ribble Status: New Consent (wra 91, S88 & Sched 10 As Amended By Env Act 1995) Issue date: 20/7/2009 Effective Date: 20/7/2009 Revocation Date: -
10C	322.0	S	372620, 440390	Address: Clitheroe Stw, Henthorn Road, Clitheroe, Lancashire Effluent Type: Sewage Discharges - Stw Storm Overflow/storm Tank - Water Company Permit Number: 017160033 Permit Version: 4	Receiving Water: Barrow Clough Status: Consent Currently Under Appeal Issue date: 24/3/2005 Effective Date: 24/3/2005 Revocation Date: -
11C	322.0	S	372620, 440390	Address: Clitheroe Stw, Henthorn Road, Clitheroe, Lancashire Effluent Type: Sewage Discharges - Stw Storm Overflow/storm Tank - Water Company Permit Number: 017160033 Permit Version: 5	Receiving Water: Barrow Clough Status: Consent Currently Under Appeal Issue date: - Effective Date: 1/1/2010 Revocation Date: -
12C	322.0	S	372620, 440390	Address: Clitheroe Stw, Henthorn Road, Clitheroe, Lancashire Effluent Type: Sewage Discharges - Stw Storm Overflow/storm Tank - Water Company Permit Number: 017160033 Permit Version: 1	Receiving Water: Barrow Clough Status: Revoked - Unspecified Issue date: - Effective Date: - Revocation Date: 30/1/1985
13C	322.0	S	372620, 440390	Address: Clitheroe Stw, Henthorn Road, Clitheroe, Lancashire Effluent Type: Sewage Discharges - Stw Storm Overflow/storm Tank - Water Company Permit Number: 017160033 Permit Version: 2	Receiving Water: Barrow Clough Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: - Effective Date: 31/1/1985 Revocation Date: -
14C	322.0	S	372620, 440390	Address: Clitheroe Stw, Henthorn Road, Clitheroe, Lancashire Effluent Type: Sewage Discharges - Stw Storm Overflow/storm Tank - Water Company Permit Number: 017160033 Permit Version: 3	Receiving Water: Barrow Clough Status: Consent Revoked Or Revised - New Consent Issued (37(1)) Issue date: - Effective Date: - Revocation Date: 23/3/2005
15	326.0	SE	373300, 440560	Address: Near Clitheroe Stw, Clitheroe, Lancashire Effluent Type: Sewage Discharges - Stw Storm Overflow/storm Tank - Water Company Permit Number: 017160177 Permit Version: 1	Receiving Water: Pendleton Brook Status: Pre Nra Legislation Where Issue Date < 01-sep-89 (historic Only) Issue date: - Effective Date: 28/6/1985 Revocation Date: -
16	413.0	NW	372398, 441470	Address: Edisford Bridge Farm, Edisford Bridge, Clitheroe, Lancashire, BB7 3LJ Effluent Type: Sewage Discharges - Final/treated Effluent - Not Water Company Permit Number: 017190929 Permit Version: 1	Receiving Water: Unnamed Trib River Ribble Status: New Consent (wra 91, S88 & Sched 10 As Amended By Env Act 1995) Issue date: 8/2/2007 Effective Date: 8/2/2007 Revocation Date: -

Records of Planning Hazardous Substance Consents and Enforcements within 500m of the study site: 0

Database searched and no data found.

1.2 Dangerous or Hazardous Sites

Records of COMAH & NIHHS sites within 500m of the study site: 0

Database searched and no data found.

1.3 Environment Agency Recorded Pollution Incidents

Records of National Incidents Recording System, List 2 within 250m of the study site: 5

The following NIRS List 2 records are represented as points on the Authorisations, Incidents and Registers Map:

ID	Distance	Direction	NGR	Details	
1	0.0	On Site	373045, 440961	Incident Date: 24/7/2006 Incident Identification: 420315 Pollutant: Sewage Materials Pollutant Description: Crude Sewage	Water Impact: Category 2 (Significant) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
2	60.0	W	372692, 441176	Incident Date: 16/4/2003 Incident Identification: 151721 Pollutant: Pollutant Not Identified Pollutant Description: Not Identified	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
3	176.0	S	372794, 440522	Incident Date: 25/7/2003 Incident Identification: 176688 Pollutant: Inert Materials and Wastes Pollutant Description: Soils and Clay	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
4A	207.0	SE	372829, 440502	Incident Date: 16/5/2003 Incident Identification: 158828 Pollutant: Contaminated Water Pollutant Description: Suspended Solids	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)
5A	209.0	SE	372833, 440502	Incident Date: 16/7/2002 Incident Identification: 92115 Pollutant: Inert Materials and Wastes Pollutant Description: Soils and Clay	Water Impact: Category 3 (Minor) Land Impact: Category 4 (No Impact) Air Impact: Category 4 (No Impact)

Records of National Incidents Recording System, List 1 within 250m of the study site: 0

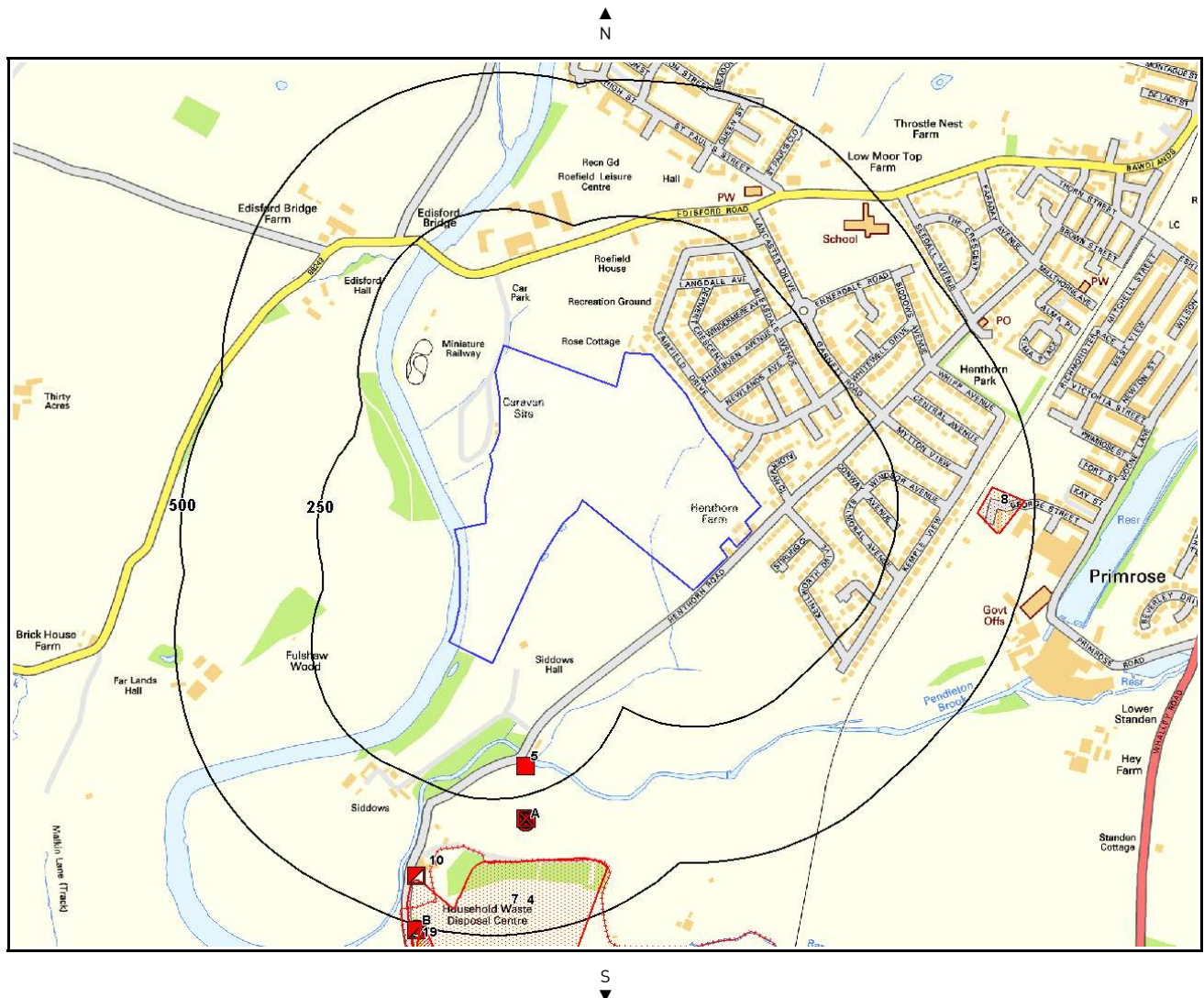
Database searched and no data found.

1.4 Sites Determined as Contaminated Land under Part IIA EPA 1990

How many records of sites determined as contaminated land under Section 78R of the Environmental Protection Act 1990 are there within 500m of the study site? 0

Database searched and no data found.

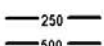
2. Landfill and Other Waste Sites Map



Landfill & Other Waste Sites Legend

Enabled by  Ordnance Survey

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- | | | |
|--|---|--|
|  Site Outline |  E.A. Active Landfill |  Operational Waste Treatment Licence |
|  Search Buffers (m) |  E.A. Historic Landfill (Area Data) |  Closed Waste Treatment Licence |
| |  E.A. Historic Landfill (Point Data) |  REGIS Waste Licence |
| |  BGS / DoE Survey Landfill |  Operational Landfill |
| |  Local Authority Landfill (Area Data) |  Closed Landfill |
| |  Local Authority Landfill (Point Data) | |

2. Landfill and Other Waste Sites

2.1 Landfill Sites

Records from Environment Agency landfill data within 1000m of the study site:

1

The following Environment Agency landfill records are represented as polygons on the Landfill and Other Waste Sites map:

ID	Distance	Direction	NGR	Details
4	340.0	S	372600, 440300	Address: Henthorn Road, Clitheroe, Blackburn, Lancashire, BB7 2QF Landfill Reference: 54102.0 Regis Reference: SIT007 Landfill Type: A4 : Household, Commercial & Industrial Waste Landfill Operator: Sita (Lancashire) Ltd Status: Modified IPPC Reference: EPR Reference:

Records of operational landfill sites sourced from Landmark within 1000m of the study site:

1

The following landfill records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance	Direction	NGR	Details
1A	300.0	S	372800, 440395	Site Address: Henthorn Road Landfill Site, CLITHEROE, Lancashire, Agency Reference: L1/3/ 1 CAA Waste Type: Difficult Waste Description: Difficult Landfill Known Restrictions: No known restriction on source of waste Record Date: 01-May-1993 Transfer Date: Modification Date: 01-May-1997 Status: Operational as far as is known Category: LANDFILL Regulator: EA - North West Region - Central Area (Preston) Size: Medium (< 75,000 tonnes/year)

Records of Environment Agency historic landfill sites within 1500m of the study site:

3

The following landfill records are represented as either points or polygons on the Landfill and Other Waste Sites map:

ID	Distance	Direction	NGR	Details
7	364.0	S	372700, 440100	Site Address: Henthorn Tip, Hewthorn, Clitheroe, Lancashire Waste Licence: - Site Reference: - Waste Type: Commercial, Liquid sludge Regis Reference: - Licence Issue: Licence Surrendered: Licence Hold Address: - Operator: Clitheroe Metropolitan Borough
8	396.0	E	373600, 440900	Site Address: Stalwart Dying Company Limited, Off Kemple View, Near Clitheroe, Lancashire Waste Licence: - Site Reference: K1/03/034 Waste Type: Waste unknown Regis Reference: - Licence Issue: Licence Surrendered: Licence Hold Address: - Operator: -
Not shown	616.0	N	373000, 442000	Site Address: Ashworth's Farm, Low Moor, Clitheroe, Lancashire Waste Licence: - Site Reference: K1/03/045 Waste Type: - Regis Reference: - Licence Issue: Licence Surrendered: Licence Hold Address: - Operator: -

Records of non-operational landfill sites sourced from Landmark within 1000m of the study site:

1

The following landfill records are represented as points on the Landfill and Other Waste Sites map:

Report Reference: CMAPS-843213

ID	Distance	Direction	NGR	Details
2A	295.0	S	372800, 440400	Site Address: Henthorne Landfill Site, CLITHEROE, Lancashire, Landfill Licence: 250AEZAL Agency Reference: H1/3/2 CAA Waste Type: Difficult Waste Description: Difficult Landfill Known Restrictions: No known restriction on source of waste Record Date: 01-Aug-1992 Transfer Date: Modification Date: Status: Record superseded Category: LANDFILL Regulator: EA - North West Region - Central Area (Preston) Size: Undefined

Records of BGS/DoE non-operational landfill sites within 1500m of the study site:

1

The following landfill records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance	Direction	NGR	Details
3B	509.0	S	372600, 440200	Address: Hewthorn Tip, Hewthorn, Clitheroe, Lancs BGS Number: 1916.0 Risk: No risk to aquifer Waste Type: N/A

Records of Local Authority landfill sites within 1500m of the study site:

1

The following landfill records are represented as points or polygons on the Landfill and Other Waste Sites map:

ID	Distance	Direction	Site Address	Source	Data Type
19	494.0	S	Refuse Tip	1964 mapping	Polygon

2.2 Other Waste Sites

Records of operational waste treatment, transfer or disposal sites within 500m of the study site:

1

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance	Direction	NGR	Details
5	198.0	S	372800, 440500	Site Address: Henthorne Road H.W.D.C., CLITHEROE, Lancashire, Landfill Licence: 25JBANAL EA Reference: L1/3/ 4 CAC Waste Type: Difficult Rating: Difficult Transfer Known Restrictions: No known restriction on source of waste Record Date: 01-May-1993 Transfer Date: Modification Date: 01-Oct-1994 Status: Operational as far as is known Category: CIVIC AMENITY Regulator: EA - North West Region - Central Area (Preston) Size: Undefined

Records of non-operational waste treatment, transfer or disposal sites within 500m of the study site:

1

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance	Direction	NGR	Details
6A	295.0	S	372800, 440400	Site Address: Henthorne Road Hwdc, CLITHEROE, Lancashire, Landfill Licence: 25JBAFAL EA Reference: J1/3/2 CAC Waste Type: Difficult Waste Description: Difficult Known Restrictions: No known restriction on source of waste Record Date: 01-Oct-1990 Transfer Date: Modification Date: 01-Aug-1992 Status: Record superseded Category: CIVIC AMENITY Regulator: EA - North West Region - Central Area (Preston) Size: Undefined

Records of Environment Agency licensed waste sites within 1500m of the study site:

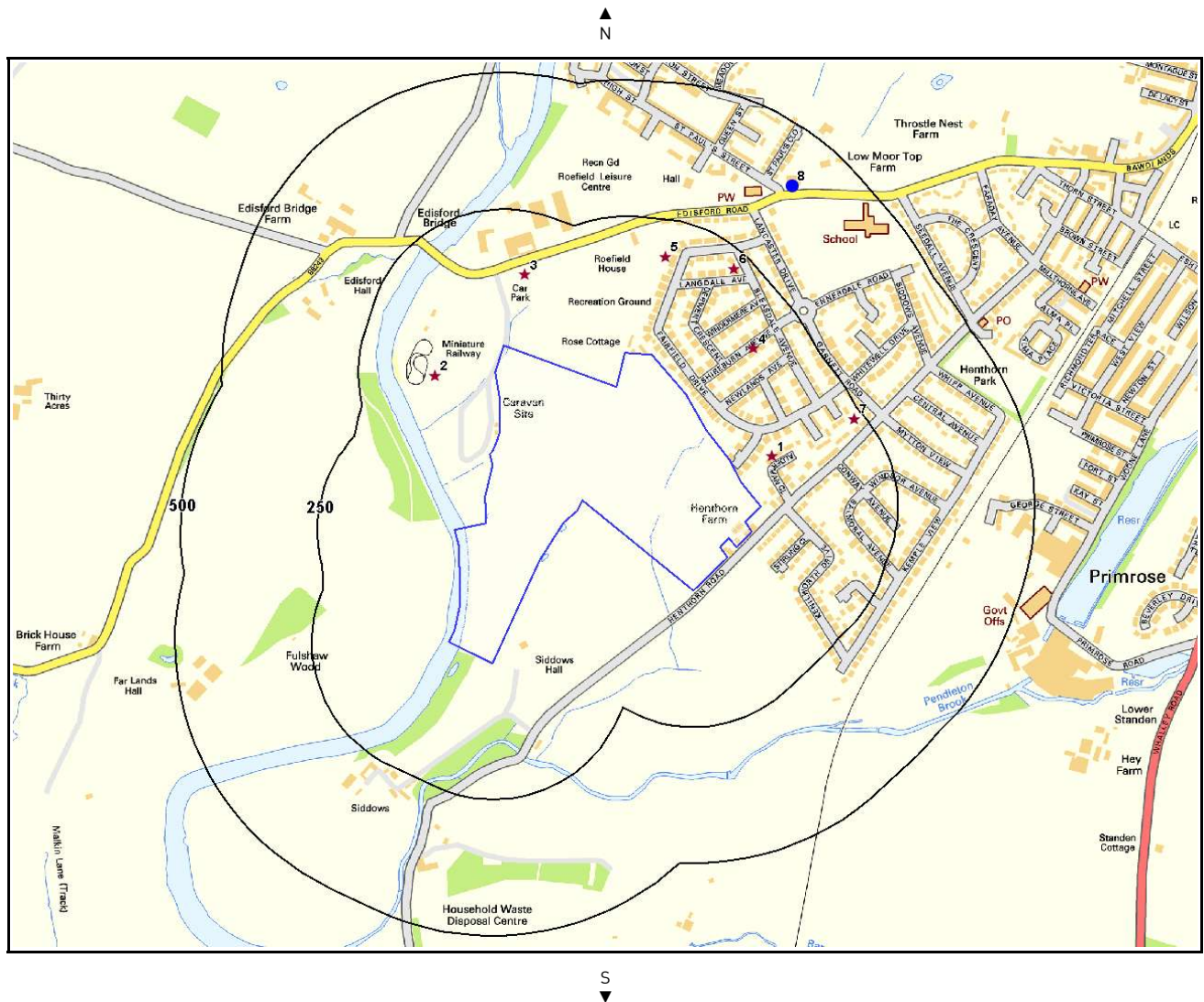
9

The following waste treatment, transfer or disposal sites records are represented as points on the Landfill and Other Waste Sites map:

ID	Distance	Direction	NGR	Details
10	413.0	S	372600, 440300	Site Address: Henthorn Road, Clitheroe, Blackburn, Lancashire, BB7 2QF Type: Household, Commercial & Industrial Waste Landfill Size: < 25000 tonnes Regis Licence Number: SIT007 EPR reference: EA/EPR/AP3095SA/V002 Operator: Sita (Lancashire) Ltd Waste Management licence No: 54102 Annual Tonnage: 0.0 Issue Date: 5/14/1993 Effective Date: - Modified: 9/2/2008 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: Henthorn Landfill Site Correspondence Address: -, Sita Tustin Court, Unit 4, Portway, Preston, Lancashire, PR2 2YQ
11B	509.0	S	372600, 440200	Site Address: Henthorn Road, Clitheroe, Lancashire, BB7 2QF Type: Special Waste Transfer Station Size: < 25000 tonnes Regis Licence Number: SIT019 EPR reference: - Operator: Sita U K Ltd Waste Management licence No: 54114 Annual Tonnage: 24999.0 Issue Date: 14/05/1993 Effective Date: - Modified: 25/11/2002 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: Henthorn Road H W D C Correspondence Address: -, Tustin Court, Portway, Preston, Lancashire, PR2 2YQ
12B	509.0	S	372600, 440200	Site Address: Henthorn Road, Clitheroe, Lancashire, BB7 2QF Type: Special Waste Transfer Station Size: < 25000 tonnes Regis Licence Number: SIT019 EPR reference: - Operator: Sita (Lancashire) Ltd Waste Management licence No: 54114 Annual Tonnage: 0.0 Issue Date: 14/05/1993 Effective Date: - Modified: 25/11/2002 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: Henthorn Road H W D C Correspondence Address: -, Tustin Court, Portway, Preston, Lancashire, PR2 2YQ
13B	509.0	S	372600, 440200	Site Address: Henthorn Road, Clitheroe, Lancashire, BB7 2QF Type: Special Waste Transfer Station Size: < 25000 tonnes Regis Licence Number: SIT019 EPR reference: - Operator: Sita (Lancashire) Ltd Waste Management licence No: 54114 Annual Tonnage: 24999.0 Issue Date: 14/05/1993 Effective Date: - Modified: 25/11/2002 Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Modified Site Name: Henthorn Road H W D C Correspondence Address: -, Tustin Court, Portway, Preston, Lancashire, PR2 2YQ
Not shown	707.0	S	372900, 440000	Site Address: Henthorn Road, Clitheroe, Blackburn, Lancashire, BB7 2QF Type: Household, Commercial & Industrial Waste Landfill Size: >= 25000 tonnes < 75000 tonnes Regis Licence Number: SIT007 EPR reference: - Operator: Sita U K Ltd Waste Management licence No: 54102 Annual Tonnage: 74999.0 Issue Date: 14/05/1993 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Henthorn Road L F S Correspondence Address: -, Tustin Court, Portway, Preston, Lancashire, PR2 2YQ
Not shown	707.0	S	372900, 440000	Site Address: Henthorn Road, Clitheroe, Blackburn, Lancashire, BB7 2QF Type: Household, Commercial & Industrial Waste Landfill Size: >= 25000 tonnes < 75000 tonnes Regis Licence Number: SIT007 EPR reference: - Operator: Sita (Lancashire) Ltd Waste Management licence No: 54102 Annual Tonnage: 0.0 Issue Date: 14/05/1993 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Henthorn Road L F S Correspondence Address: -, Tustin Court, Portway, Preston, Lancashire, PR2 2YQ
Not shown	707.0	S	372900, 440000	Site Address: Henthorn Road, Clitheroe, Blackburn, Lancashire, BB7 2QF Type: Household, Commercial & Industrial Waste Landfill Size: >= 25000 tonnes < 75000 tonnes Regis Licence Number: SIT007 EPR reference: - Operator: Sita (Lancashire) Ltd Waste Management licence No: 54102 Annual Tonnage: 74999.0 Issue Date: 14/05/1993 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: Issued Site Name: Henthorn Road L F S Correspondence Address: -, Tustin Court, Portway, Preston, Lancashire, PR2 2YQ

Not shown	736.0	S	373000, 440000	Site Address: Henthorn Road, Clitheroe, Blackburn, Lancashire, BB7 2QF Type: - Size: < 25000 tonnes Regis Licence Number: SIT208 EPR reference: - Operator: Sita (Lancashire) Ltd Waste Management licence No: 54494 Annual Tonnage: 0.0	Issue Date: 31/03/2006 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: IPPC Site Name: Henthorn Road L T P Correspondence Address: -, Tustin Court, Portway, Preston, Lancashire, PR2 2YQ
Not shown	736.0	S	373000, 440000	Site Address: Henthorn Road, Clitheroe, Blackburn, Lancashire, BB7 2QF Type: Co-Disposal Landfill Site Size: < 25000 tonnes Regis Licence Number: SIT208 EPR reference: - Operator: Sita (Lancashire) Ltd Waste Management licence No: 54494 Annual Tonnage: 0.0	Issue Date: 31/03/2006 Effective Date: - Modified: - Surrendered Date: - Expiry Date: - Cancelled Date: - Status: IPPC Site Name: Henthorn Road L T P Correspondence Address: -, Tustin Court, Portway, Preston, Lancashire, PR2 2YQ

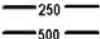
3. Current Land Use Map



Current Land Use Legend



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-  Site Outline
-  Current Industrial Sites
-  Petrol & Fuel Sites
-  Underground High Pressure Oil & Fuel Pipelines
-  Search Buffers (m)

3. Current Land Uses

3.1 Current Industrial Data

Records of potentially contaminative industrial sites within 250m of the study site:

7

The following records are represented as points on the Current Land Uses map.

ID	Distance	Direction	Company	Address	Activity	Category
1	71.0	NE	Hodder Motor Services Ltd	3, Alderford Close, Clitheroe, BB7 2QP	Vehicle Hire and Rental	Hiring And Contract Services
2	112.0	W	Miniature Railway	-	Railways (Heritage, Steam and Miniature)	Tourism
3	135.0	N	Electricity Sub Station	-	Electrical Features	Infrastructure And Facilities
4	150.0	NE	Electricity Sub Station	-	Electrical Features	Infrastructure And Facilities
5	182.0	N	Electricity Sub Station	-	Electrical Features	Infrastructure And Facilities
6	218.0	NE	B & H Transport	4, Bleasdale Avenue, Clitheroe, BB7 2PF	Distribution and Haulage	Transport, Storage And Delivery
7	233.0	NE	Electricity Sub Station	-	Electrical Features	Infrastructure And Facilities

3.2 Petrol and Fuel Sites

Records of petrol or fuel sites within 500m of the study site:

1

The following petrol or fuel site records provided by Catalist are represented as points on the Current Land Use map:

ID	Distance	Direction	NGR	Company	Address	LPG	Status
8	403.0	NE		Obsolete	Vantage-network Q, Edisford Road, Edisford Road, Clitheroe, Lancashire, BB7 2LT	Not Applicable	Obsolete

3.3 Underground High Pressure Oil and Gas Pipelines

Records of high pressure underground pipelines within 500m of the study site:

0

Database searched and no data found.

4. Geology

4.1 Artificial Ground and Made Ground

Database searched and no data found.

The database has been searched on site, including a 50m buffer.

4.2 Superficial Ground and Drift Geology

The database has been searched on site, including a 50m buffer.

Lex Code	Description	Rock Type
TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
ALV-CSSG	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL

(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

4.3 Bedrock and Solid Geology

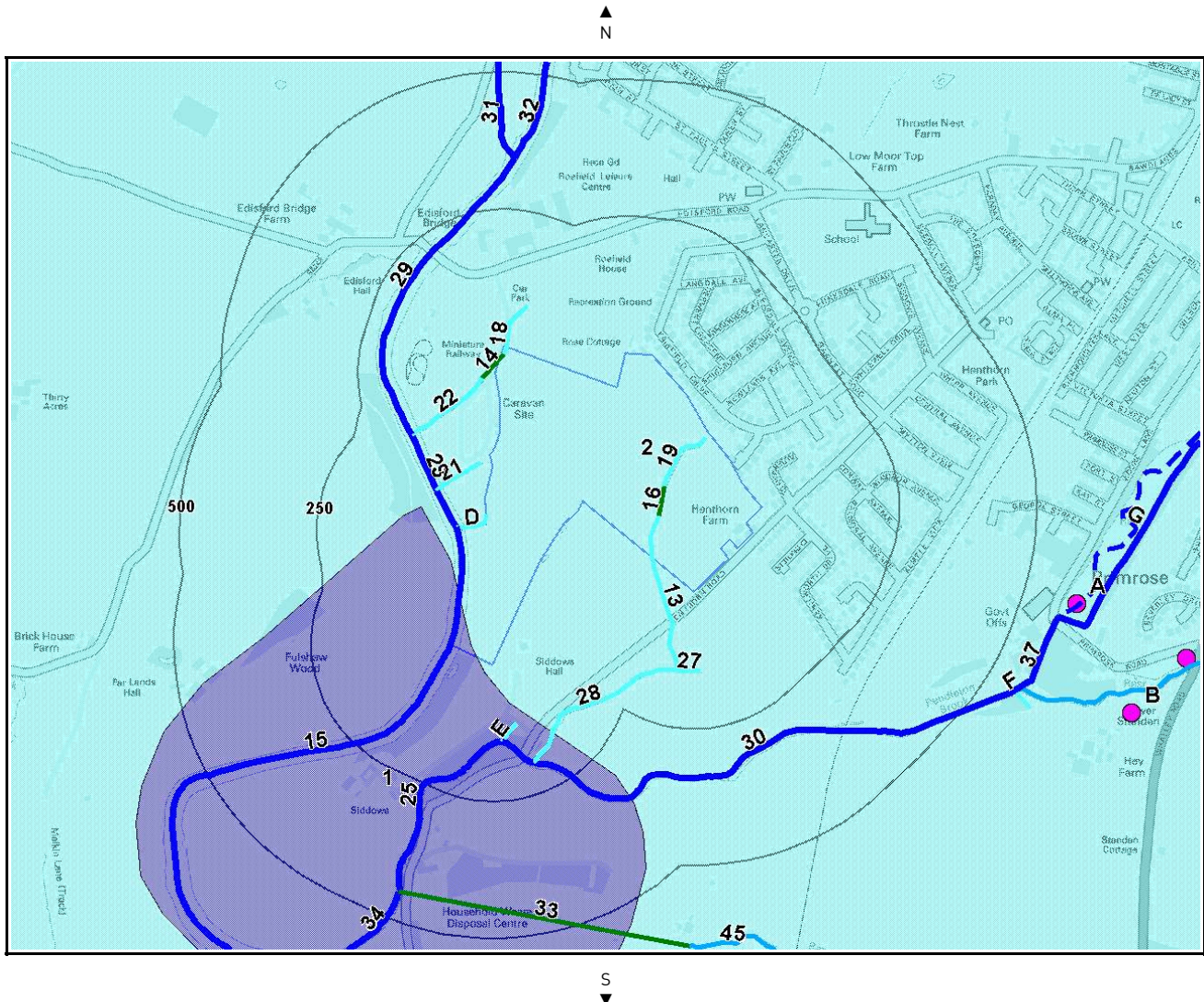
The database has been searched on site, including a 50m buffer.

LEX Code	Description	Rock Type
CLHOM-MDST	CLITHEROE LIMESTONE FORMATION AND HODDER MUDSTONE FORMATION (UNDIFFERENTIATED)	MUDSTONE

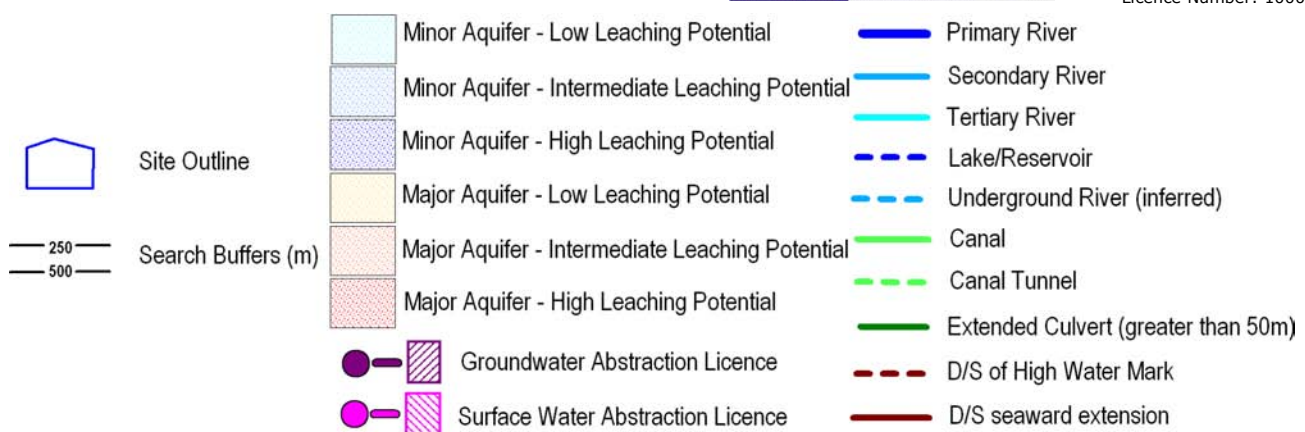
(Derived from the BGS 1:50,000 Digital Geological Map of Great Britain)

For more detailed geological and ground stability data please refer to the "GroundSure GeoInsight". Available from our website.

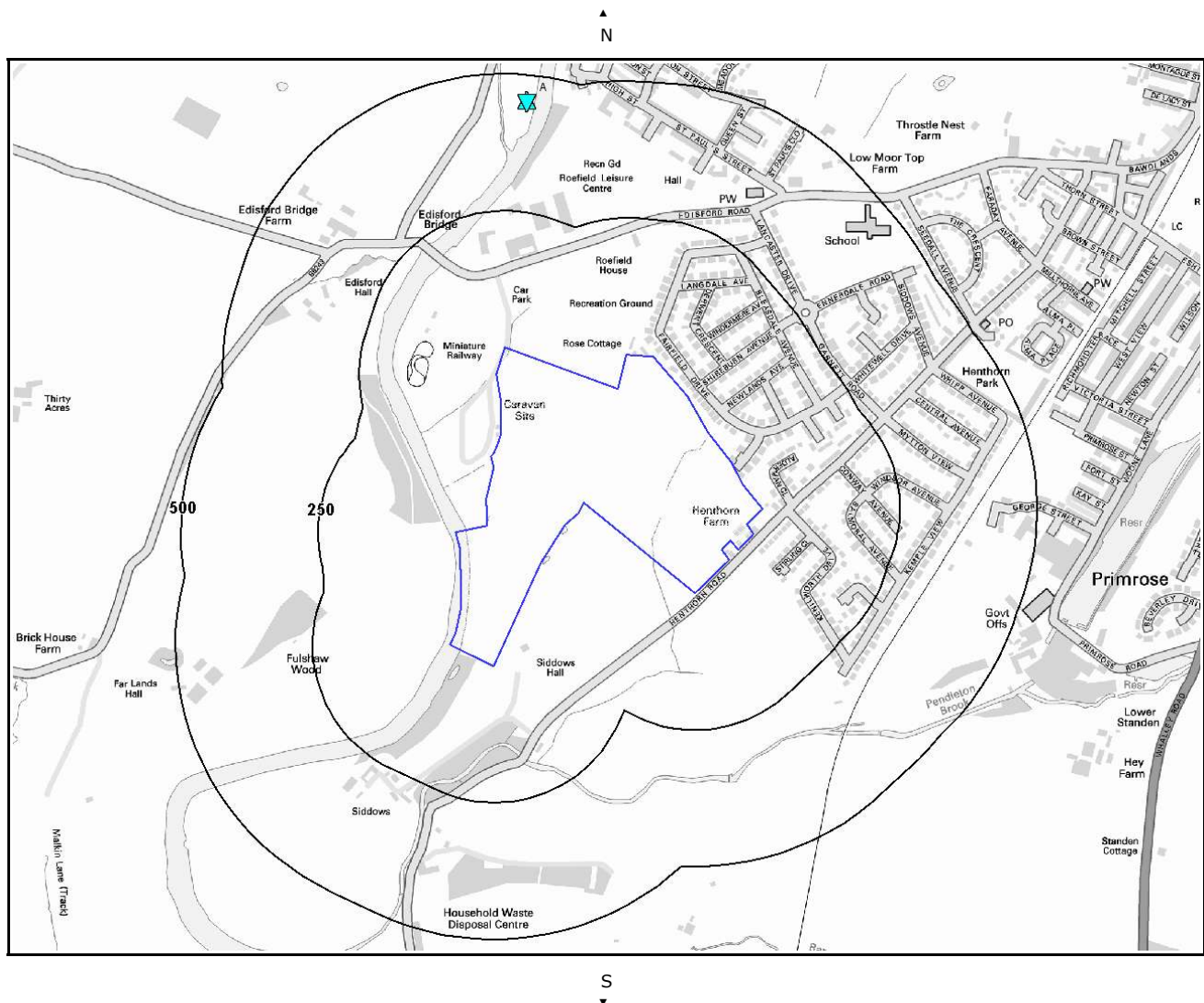
5. Hydrogeology and Hydrology - Aquifer and Abstraction Licence Map



Hydrogeology and Hydrology Legend



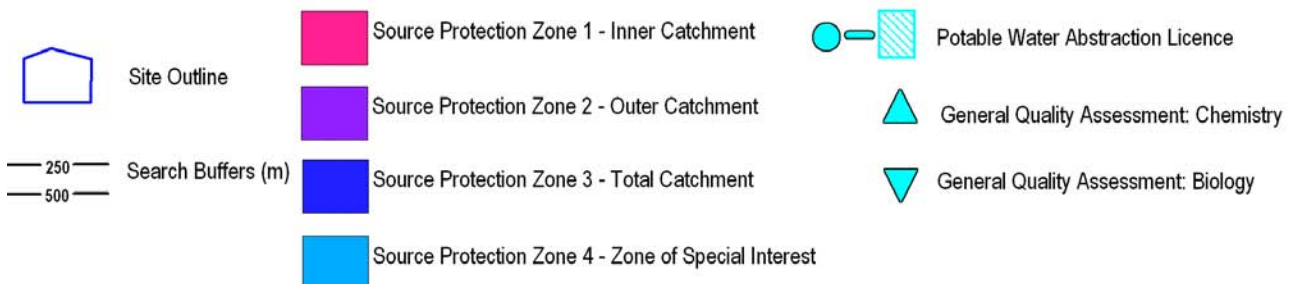
5b. Hydrogeology and Hydrology - SPZ and Potable Water Abstraction Map



Hydrogeology and Hydrology Legend



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5. Hydrogeology and Hydrology

5.1 Groundwater Vulnerability and Soil Classification

Records of aquifer and soil classification within 200m of the study site:

Yes

The following groundwater information is represented as polygons on the Aquifer and Abstraction Licence Map:

ID	Distance	Direction	Classification
1	0.0	On Site	Minor Aquifer/High Leaching Potential
2	0.0	On Site	Minor Aquifer/Low Leaching Potential

5.2 Groundwater Abstraction Licences

Are there any Groundwater Abstraction Licences within 1000m of the study site?

No

Database searched and no data found.

5.3 Surface Water Abstraction Licences

Are there any Surface Water Abstraction Licences within 1000m of the study site?

Yes

The following Surface Water Abstraction Licences records are represented as points, lines and regions on the Aquifer and Abstraction Licence Map:

ID	Distance	Direction	NGR	Details	
5A	598.0	E	373800, 440800	Licence No: 2671309033 Details: Transfer between sources Direct Source: Surface, Non-tidal - North West Region Point: Mearley Brk Feeding Primrose Lodge At Clitheroe \$314 Data Type: Point	Annual Volume (m³): - Max Daily Volume (m³): - Application No: 4549 Original Start Date: 16/12/1966 Expiry Date: - Issue No: 100 Version Start Date: 16/12/1966 Version End Date: -
6A	598.0	E	373800, 440800	Licence No: 2671309033 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Surface, Non-tidal - North West Region Point: Mearley Brk Feeding Primrose Lodge At Clitheroe \$314 Data Type: Point	Annual Volume (m³): - Max Daily Volume (m³): - Application No: 4549 Original Start Date: 16/12/1966 Expiry Date: - Issue No: 100 Version Start Date: 16/12/1966 Version End Date: -
7B	762.0	SE	373900, 440600	Licence No: 2671309032 Details: Transfer between sources Direct Source: Surface, Non-tidal - North West Region Point: Pendleton Brk@clitheroe Feeding Mill Pond,primrose Wks \$313 Data Type: Point	Annual Volume (m³): - Max Daily Volume (m³): - Application No: 4549 Original Start Date: 16/12/1966 Expiry Date: - Issue No: 100 Version Start Date: 1/12/1993 Version End Date: -
8B	762.0	SE	373900, 440600	Licence No: 2671309032 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Surface, Non-tidal - North West Region Point: Pendleton Brk@clitheroe Feeding Mill Pond,primrose Wks \$313 Data Type: Point	Annual Volume (m³): - Max Daily Volume (m³): - Application No: 4549 Original Start Date: 16/12/1966 Expiry Date: - Issue No: 100 Version Start Date: 1/12/1993 Version End Date: -

9C	819.0	E	374000, 440700	Licence No: 2671309032 Details: Transfer between sources Direct Source: Surface, Non-tidal - North West Region Point: Pendleton Brk@clitheroe Feeding The Mill Pond, Primrose Wks Data Type: Point	Annual Volume (m³): - Max Daily Volume (m³): - Application No: 4549 Original Start Date: 16/12/1966 Expiry Date: - Issue No: 100 Version Start Date: 1/12/1993 Version End Date: -
10C	819.0	E	374000, 440700	Licence No: 2671309032 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Surface, Non-tidal - North West Region Point: Pendleton Brk@clitheroe Feeding The Mill Pond, Primrose Wks Data Type: Point	Annual Volume (m³): - Max Daily Volume (m³): - Application No: 4549 Original Start Date: 16/12/1966 Expiry Date: - Issue No: 100 Version Start Date: 1/12/1993 Version End Date: -
Not shown	899.0	E	374100, 441200	Licence No: 2671309033 Details: Transfer between sources Direct Source: Surface, Non-tidal - North West Region Point: Mearley Brk Feeding Primrose Lodge At Clitheroe Data Type: Point	Annual Volume (m³): - Max Daily Volume (m³): - Application No: 4549 Original Start Date: 16/12/1966 Expiry Date: - Issue No: 100 Version Start Date: 16/12/1966 Version End Date: -
Not shown	899.0	E	374100, 441200	Licence No: 2671309033 Details: General use relating to Secondary Category (Medium Loss) Direct Source: Surface, Non-tidal - North West Region Point: Mearley Brk Feeding Primrose Lodge At Clitheroe Data Type: Point	Annual Volume (m³): - Max Daily Volume (m³): - Application No: 4549 Original Start Date: 16/12/1966 Expiry Date: - Issue No: 100 Version Start Date: 16/12/1966 Version End Date: -

5.4 Potable Water Abstraction Licences

Are there any Potable Water Abstraction Licences within 2000m of the study site?

No

Database searched and no data found.

5.5 Source Protection Zones

Are there any Source Protection Zones within 500m of the study site?

No

Database searched and no data found.

5.6 River Quality

Is there any Environment Agency information on river quality within 1500m of the study site?

Yes

Biological Quality:

Biological Quality data describes water quality in terms of 83 groups of macroinvertebrates, some of which are pollution sensitive. The results are graded from A ('Very Good') to F ('Bad').

ID	Distance [m]	Direction	NGR	River Details	Biological Quality Grade				
					2004	2005	2006	2007	2008
5A	451.0	N	372800, 441720	River Name: Bashall Brook Reach: Qsl Bashall Hall To Ribble End/Start of Stretch: End of Stretch NGR	B	B	B	B	B
Not shown	636.0	S	372500, 440100	River Name: Ribble Reach: Stock Beck To Clitheroe Stw End/Start of Stretch: End of Stretch NGR	B	B	B	B	A

Report Reference: CMAPS-843213

Not shown	636.0	S	372500, 440100	River Name: Ribble Reach: Clitheroe Stw To Hodder End/Start of Stretch: Start of Stretch NGR	C	C	B	B	B
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Chemical Quality:

Chemical quality data is based on the General Quality Assessment Headline Indicators scheme (GQAH). In England, each chemical sample is measured for ammonia and dissolved oxygen. In Wales, the samples are measured for biological oxygen demand (BOD), ammonia and dissolved oxygen. The results are graded from A ('Very Good') to F ('Bad').

ID	Distance [m]	Direction	NGR	River Details	Chemical Quality Grade (Headline Indicator)				
					2004	2005	2006	2007	2008
1A	451.0	N	372800, 441720	River Name: Bashall Brook Reach: Qsl Bashall Hall To Ribble End/Start of Stretch: End of Stretch NGR	A	A	A	A	A
Not shown	529.0	N	372794, 441799	River Name: Bashall Brook Reach: Qsl Bashall Hall To Ribble End/Start of Stretch: Sample Point NGR	A	A	A	A	A
Not shown	636.0	S	372500, 440100	River Name: Ribble Reach: Clitheroe Stw To Hodder End/Start of Stretch: Start of Stretch NGR	A	A	A	A	A
Not shown	636.0	S	372500, 440100	River Name: Ribble Reach: Stock Beck To Clitheroe Stw End/Start of Stretch: End of Stretch NGR	A	A	A	A	A

5.7 Detailed River Network

Are there any Detailed River Network entries within 500m of the study site?

Yes

The following Detailed River Network records are represented on the Aquifer and Abstractions Map:

ID	Distance	Direction	Details	
13	0.0	On Site	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
14	0.0	On Site	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Extended Culvert (greater than 50m) Catchment: - Drain: NO Main River Status: Currently Undefined
15	0.0	On Site	River Name: River Ribble Water Course Name: RIVER RIBBLE Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
16	0.0	On Site	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Extended Culvert (greater than 50m) Catchment: - Drain: NO Main River Status: Currently Undefined
17D	0.0	On Site	River Name: Drain Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: YES Main River Status: Currently Undefined
18	0.0	On Site	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
19	0.0	On Site	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined

Report Reference: CMAPS-843213

20D	5.0	N	River Name: - Water Course Name: RIVER RIBBLE Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
21	20.0	W	River Name: Drain Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: YES Main River Status: Currently Undefined
22	25.0	W	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
23	79.0	NW	River Name: - Water Course Name: RIVER RIBBLE Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
24E	115.0	S	River Name: Drain Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: YES Main River Status: Currently Undefined
25	141.0	S	River Name: Pendleton Brook Water Course Name: PENDLETON/MEARLEY BROOK Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
26E	142.0	S	River Name: - Water Course Name: PENDLETON/MEARLEY BROOK Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
27	144.0	S	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
28	146.0	S	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Tertiary River Catchment: - Drain: NO Main River Status: Currently Undefined
29	148.0	W	River Name: River Ribble Water Course Name: RIVER RIBBLE Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
30	193.0	S	River Name: Pendleton Brook Water Course Name: PENDLETON/MEARLEY BROOK Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
31	344.0	N	River Name: Bashall Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
32	344.0	N	River Name: River Ribble Water Course Name: RIVER RIBBLE Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined
33	439.0	S	River Name: - Water Course Name: - Welsh River Name: - Alternative Name: -	River Type: Extended Culvert (greater than 50m) Catchment: - Drain: NO Main River Status: Currently Undefined
34	448.0	S	River Name: - Water Course Name: PENDLETON/MEARLEY BROOK Welsh River Name: - Alternative Name: -	River Type: Primary River Catchment: - Drain: NO Main River Status: Currently Undefined

5.8 Surface Water Features

Are there any surface water features within 250m of the study site?

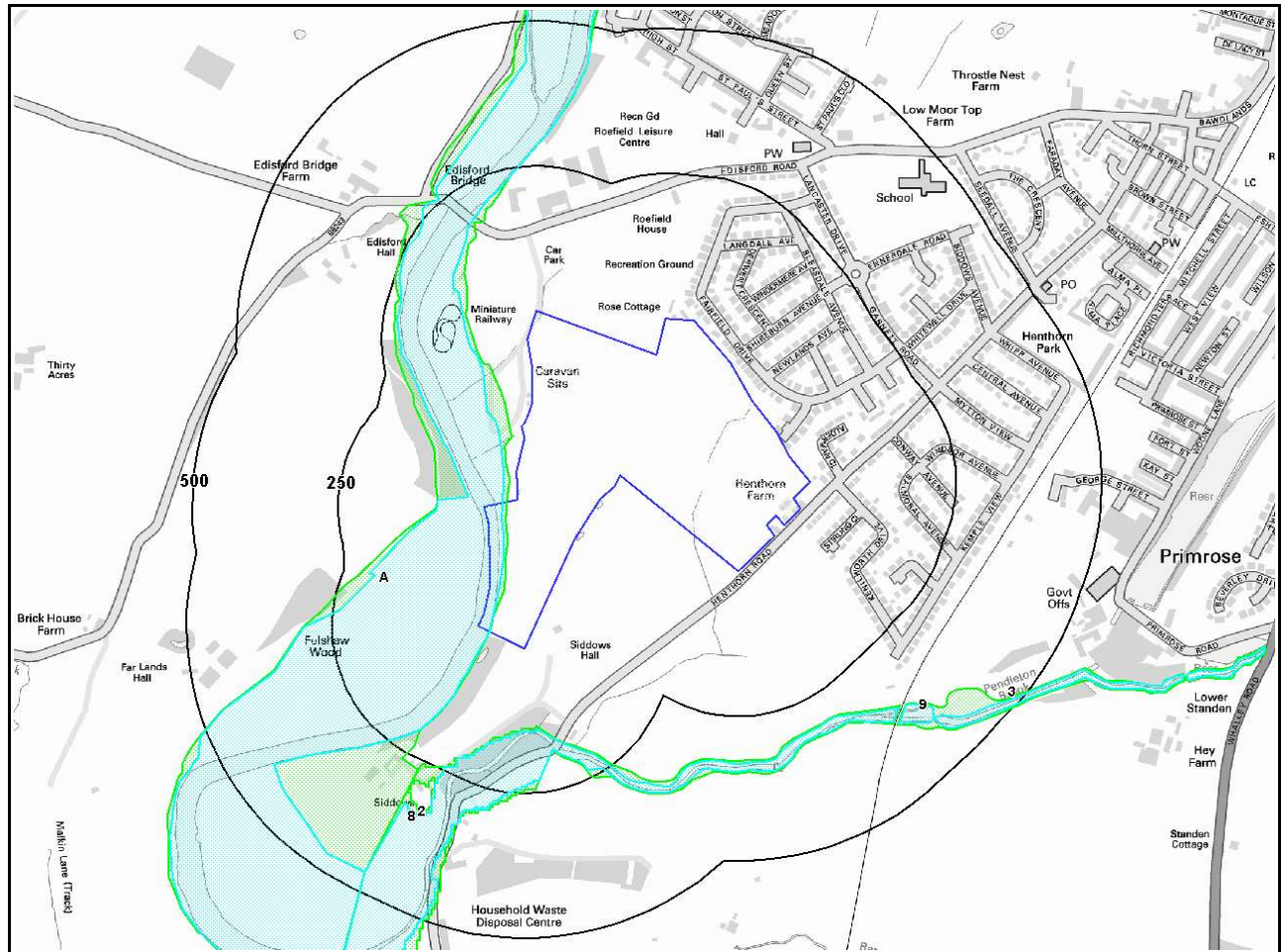
Yes

The following surface water records are not represented on mapping:

Distance to Surface Water (m)	on-site	0-50	51-250
Surface water features within 250m of the study site	Yes	Yes	Yes

Report Reference: CMAPS-843213

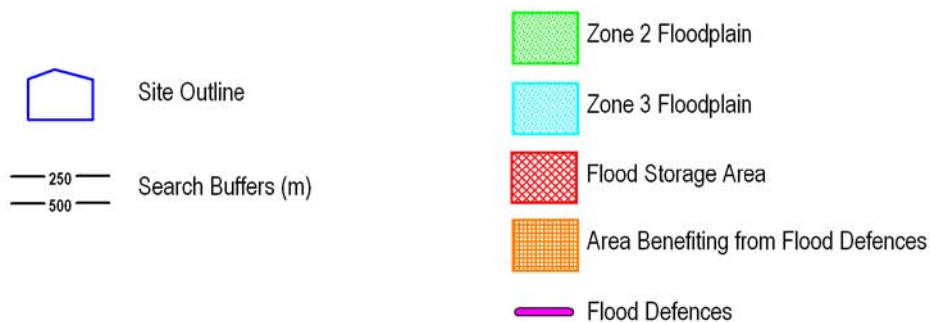
6. Surface Water Flood Map



Surface Water Flood Legend



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6. Flooding

6.1 Zone 2 Flooding

Zone 2 floodplain estimates the annual probability of flooding as one in one thousand (0.1%) or greater from rivers and the sea but less than 1% from rivers or 0.5% from the sea. Alternatively, where information is available they may show the highest known flood level.

Is the site within 250m of an Environment Agency indicative Zone 2 floodplain? **Yes**

The following floodplain records are represented as green shading on the Flood Map:

ID	Distance	Direction	Update	Type
1A	0.0	On Site	18-Mar-2010	Zone 2 - (Fluvial)
2	135.0	S	18-Mar-2010	Zone 2 - (Fluvial)

6.2 Zone 3 Flooding

Zone 3 estimates the annual probability of flooding as one in one hundred (1%) or greater from rivers and a one in two hundred (0.5%) or greater from the sea. Alternatively, where information is available they may show the highest known flood level.

Is the site within 250m of an Environment Agency indicative Zone 3 floodplain? **Yes**

The following floodplain records are represented as blue shading on the Flood Map:

ID	Distance	Direction	Update	Type
7A	0.0	On Site	18-Mar-2010	Zone 3 - (Fluvial)
8	140.0	S	18-Mar-2010	Zone 3 - (Fluvial)

6.3 Flood Defences

Are there any Flood Defences within 250m of the study site? **No**

6.4 Areas benefiting from Flood Defences

Are there any areas benefiting from Flood Defences within 250m of the study site? **No**

6.5 Areas used for Flood Storage

Are there any areas used for Flood Storage within 250m of the study site? **No**

6.6 Groundwater Flooding Susceptibility Areas

Are there any British Geological Survey groundwater flooding susceptibility flood areas within 50m of the boundary of the study site? **Yes**

What is the highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions?

High

6.7 Groundwater Flooding Confidence Areas

What is the British Geological Survey confidence rating in this result?

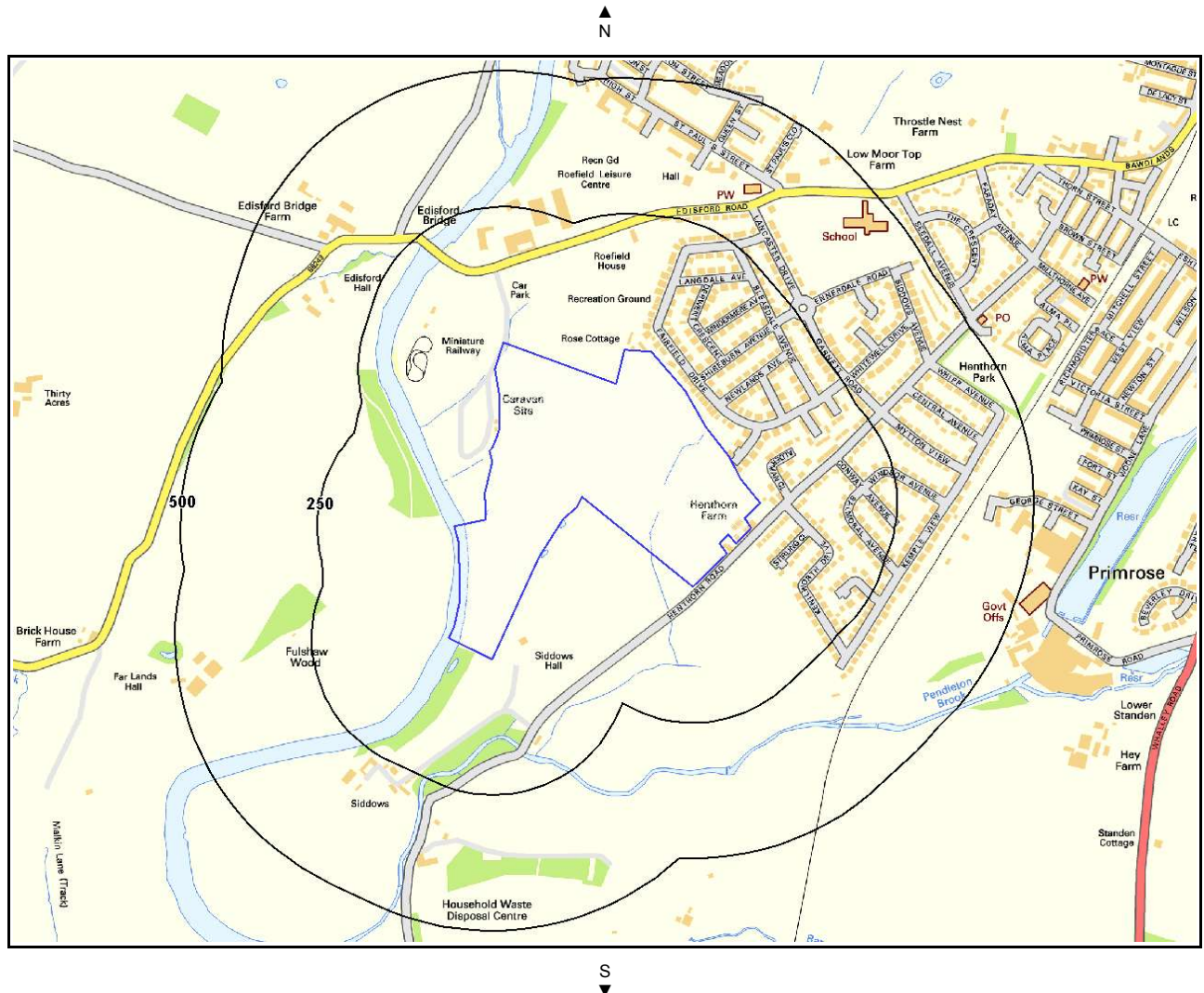
Moderate

Notes:

Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

The **confidence rating** is on a fivefold scale - Low, Moderately Low, Moderate, Moderately High and High. This provides a relative indication of the BGS confidence in the accuracy of the susceptibility result for groundwater flooding. This is based on the amount and precision of the information used in the assessment. In areas with a relatively lower level of confidence the susceptibility result should be treated with more caution. In other areas with higher levels of confidence the susceptibility result can be used with more confidence.

7.Designated Environmentally Sensitive Sites Map



Designated Environmentally Sensitive Sites Legend

Enabled by Ordnance Survey

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7. Designated Environmentally Sensitive Sites

Presence of Designated Environmentally Sensitive Sites within 500m of the study site?	Yes
Records of Sites of Special Scientific Interest (SSSI) within 500m of the study site:	0
Database searched and no data found.	
Records of National Nature Reserves (NNR) within 500m of the study site:	0
Database searched and no data found.	
Records of Special Areas of Conservation (SAC) within 500m of the study site:	0
Database searched and no data found.	
Records of Special Protection Areas (SPA) within 500m of the study site:	0
Database searched and no data found.	
Records of Ramsar sites within 500m of the study site:	0
Database searched and no data found.	
Records of Local Nature Reserves (LNR) within 500m of the study site:	0
Database searched and no data found.	
Records of World Heritage Sites within 500m of the study site:	0
Database searched and no data found.	
Records of Environmentally Sensitive Areas within 500m of the study site:	0
Database searched and no data found.	
Records of Areas of Outstanding Natural Beauty (AONB) within 500m of the study site:	0
Database searched and no data found.	
Records of National Parks (NP) within 500m of the study site:	0
Database searched and no data found.	

Records of Nitrate Sensitive Areas within 500m of the study site:

0

Database searched and no data found.

Records of Nitrate Vulnerable Zones within 500m of the study site:

1

The following Nitrate Vulnerable Zone records produced by DEFRA are not represented as polygons on the Designated Environmentally Sensitive Sites Map:

ID	Distance	Direction	NVZ Name	Data Source
	0.0	On Site	No place name provided	DEFRA

8. Natural Hazards Findings

8.1 Detailed BGS GeoSure Data

BGS GeoSure Data has been searched to 50m. The data is included in tabular format. If you require further information on geology and ground stability, please obtain a GroundSure GeoInsight, available from our website. The following information has been found:

8.1.1 Shrink Swell

What is the maximum Shrink-Swell* hazard rating identified on the study site?

Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard	
Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.	

8.1.2 Landslides

What is the maximum Landslide* hazard rating identified on the study site?

Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard	
Possibility of slope instability problems after major changes in ground conditions. Consideration should be given to stability if changes to drainage or excavations take place. Possible increase in construction cost to reduce potential slope stability problems.	
Existing property	no significant increase in insurance risk due to natural slope instability problems.

8.1.3 Soluble Rocks

What is the maximum Soluble Rocks* hazard rating identified on the study site?

Very Low

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard	
Significant soluble rocks are present. Problems unlikely except with considerable surface or subsurface water flow. No special actions required to avoid problems due to soluble rocks. No special ground investigation required or increased construction costs are likely. An increase in financial risk due to potential problems with soluble rocks is unlikely.	

8.1.4 Compressible Ground

What is the maximum Compressible Ground* hazard rating identified on the study site?

Moderate

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard	
--------	--

Significant potential for compressibility problems. Avoid large differential loadings of ground. Do not drain or de-water ground near the property without technical advice. For new build consider possibility of compressible ground in ground investigation, construction and building design. Consider effects of groundwater changes. Extra construction costs are likely. For existing property possible increase in insurance risk from compressibility, especially if water conditions or loading of the ground change significantly.

8.1.5 Collapsible Rocks

What is the maximum Collapsible Rocks* hazard rating identified on the study site? **Null - Negligible**

No indicators for collapsible deposits identified; No special actions required to avoid problems due to collapsible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with collapsible deposits.

8.1.6 Running Sand

What is the maximum Running Sand* hazard rating identified on the study site? **Low**

The following natural subsidence information provided by the British Geological Survey is not represented on mapping:

Hazard

Possibility of running sand problems after major changes in ground conditions. Normal maintenance to avoid leakage of water-bearing services or water bodies (ponds, swimming pools) should reduce likelihood of problems due to running sand. For new build consider possibility of running sand into trenches or excavations if water table is high or sandy strata are exposed to water. Avoid concentrated water inputs to site. Unlikely to be an increase in construction costs due to potential for running sand. For existing property no significant increase in insurance risk due to running sand problems is likely.

* This indicates an automatically generated 50m buffer and site.

9. Mining

9.1 Coal Mining

Are there any coal mining areas within 75m of the study site?

No

Database searched and no data found.

9.2 Shallow Mining

What is the subsidence hazard relating to shallow mining on-site*?

Negligible

*Please note this data is searched with a 150m buffer.

9.3 Brine Affected Areas

Are there any brine affected areas within 75m of the study site?

No

Database searched and no data found.

10. Contacts

CENTREMAPS

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groundsure@centremaps.co.uk
CENTREMAPS, Brockamin House, Leigh, Worcester, London,
WR6 5JU

Directors: M C Walker, MInst C.E.S., C M Walker,
S J Hawkins BSc (Hons), S E Stewart BSc (Hons)
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Registered Company: Laser Surveys Limited
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enquiries@bgs.ac.uk
Web: www.bgs.ac.uk
BGS Geological Hazards Reports and general geological
enquiries

centremapslive.com
the mapping portal from Laser Surveys



Environment Agency

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PO Box 544
Rotherham
S60 1BY
Tel: 08708 506 506
Web: www.environment-agency.gov.uk
Email: enquiries@environment-agency.gov.uk



Health Protection Agency

Chilton, Didcot, Oxon, OX11 0RQ
Tel: 01235 822622 www.hpa.org.uk/radiation
Radon measures and general radon information and
guidance



The Coal Authority

200 Lichfield Lane, Mansfield, Notts NG18 4RG
Tel: 0845 762 6848. DX 716176 Mansfield 5
www.coal-authority.co.uk
Coal mining reports and related enquiries



Ordnance Survey

Romsey Road
Southampton SO16 4GU
Tel: 08456 050505



Local Authority

Authority: Ribble Valley Borough Council
Phone: 01200 425111
Web: www.ribblevalley.gov.uk
Address: Council Offices, Church Walk, Clitheroe,
Lancashire, BB7 2RA

Get Mapping PLC

Virginia Villas, High Street, Hartley Witney, Hampshire RG27
8NW
Tel: 01252 845444



Acknowledgements

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This report has been prepared in accordance with the GroundSure Ltd standard Terms and Conditions of business for work of this nature.

Standard Terms and Conditions

1 Definitions

In these conditions unless the context otherwise requires:

"Beneficiary" means the Client or the customer of the Client for whom the Client has procured the Services.

"Commission" means an order for Consultancy Services submitted by a Client.

"Consultancy Services" mean consultancy services provided by GroundSure including, without limitation, carrying out interpretation of third party and in-house environmental data, provision of environmental consultancy advice, undertaking environmental audits and assessments, Site investigation, Site monitoring and related items.

"Content" means any data, database or other information contained in a Report or Mapping which is provided to GroundSure by a Data Provider.

"Contract" means the contract between GroundSure and the Client for the performance of the Services which arises upon GroundSure's acceptance of an Order or Commission and which shall incorporate these conditions, the relevant GroundSure User Guide, proposal by GroundSure and the content of any subsequent report, and any agreed amendments in accordance with condition 11.

"Client" means the party that submits an Order or Commission.

"Data Provider" means any third party providing Content to GroundSure.

"Data Report" means reports comprising factual data with no professional interpretation in respect of the level of likely risk and/or liability available from GroundSure.

"GroundSure" means GroundSure Limited, a company registered in England and Wales under number 03421028 and whose registered office is at Greater London House, Hampstead Road, London NW1 7EJ.

"Home Information Pack" means a combination of reports required when selling a residential property.

"Intellectual Property" means any patent, copyright, design rights, service marks, moral rights, data protection rights, know-how, trade mark or any other intellectual property rights.

"Mapping" an historical map or a combination of historical maps of various ages, time periods and scales available from GroundSure.

"Order" means an order form submitted by the Client requiring Services from GroundSure in respect of a specified Site.

"Order Website" means online platform via which Orders may be placed.

"Report" means a Risk Screening Report or Data Report for commercial or residential property available from GroundSure relating to the Site prepared in accordance with the specifications set out in the relevant User Guide.

"Risk Screening Report" means one of GroundSure's risk screening reports such as GroundSure Homebuyers, GroundSure Home Environmental GroundSure SiteGuard, GroundSure Screening, GroundSure Review, GroundSure Developer Review, or any other risk screening report available from GroundSure.

"Services" means the provision of any Report, Mapping or Consultancy Services which GroundSure has agreed to carry out for the Client/Beneficiary on these terms and conditions in respect of the Site.

"Site" means the landsite in respect of which GroundSure provides the Services.

"User Guide" means the relevant current version of the user guide, available upon request from GroundSure.

2 Scope of Services

2.1 GroundSure agrees to carry out the Services in accordance with the Contract and to the extent set out therein.

2.2 GroundSure shall exercise all the reasonable skill, care and diligence to be expected of experienced environmental consultants in the performance of the Services.

2.3 The Client acknowledges that it has not relied on any statement or representation made by or on behalf of GroundSure which is not set out and expressly agreed in the Contract.

2.4 Terms and conditions appearing on a Client's order form, printed stationery or other communication, including invoices, to GroundSure, its employees, servants, agents or other representatives or any terms implied by custom, practice or course of dealing shall be of no effect and these terms and conditions shall prevail over all others.

2.5 In the event that a Client/Beneficiary opts to take out insurance in conjunction with or as a result of the Services, such insurance shall be subject solely to the terms of any policy issued to it in that respect and GroundSure will have no liability therefore.

2.6 GroundSure's quotations/proposals are valid for a period of 30 days only. GroundSure reserves the right to withdraw any quotation at any time before GroundSure accepts an Order or Commission. GroundSure's acceptance of an Order or Commission shall be effective only where such acceptance is in writing and signed by GroundSure's authorised representative or where accepted via GroundSure's Order Website.

3 The Client's obligations

3.1 The Client shall be solely responsible for ensuring that the Report/Mapping ordered is appropriate and suitable for the Beneficiary's needs.

3.2 The Client shall (or shall procure that the Beneficiary shall) supply to GroundSure as soon as practicable and without charge all information necessary and accurate relevant data including any specific and/or unusual environmental information relating to the Site known to the Client/Beneficiary which may pertain to the Services and shall give such assistance as GroundSure shall reasonably require in the performance of the Services (including, without limitation, access to a Site, facilities and equipment as agreed in the Contract).

3.3 Where Client/Beneficiary approval or decision is required, such approval or decision shall be given or procured in reasonable time as not to delay or disrupt the performance of any other part of the Services.

3.4 The Client shall not and shall not knowingly permit the Beneficiary to, save as expressly permitted by these terms and conditions, re-sell, alter, add to, amend or use out of context the content of any Report, Mapping or, in respect of any Services, information given by GroundSure. For the avoidance of doubt, the Client and Beneficiary may make the Report, Mapping or GroundSure's findings available to a third party, but such third party cannot rely on the same unless expressly permitted under condition 4.

3.5 The Client is responsible for maintaining the confidentiality of its user name and password if using GroundSure's internet ordering service and accepts responsibility for all activity that occurs under such account and password.

4 Reliance

4.1 Upon full payment of all relevant fees and subject to the provisions of these terms and conditions, the Client and Beneficiary are granted an irrevocable royalty-free licence to use the information contained in the Report, Mapping or in a report prepared by GroundSure in respect of or arising out of the Consultancy Services. The Services may only be used for the benefit of the Client and those persons listed in conditions 4.2 and 4.3.

4.2 In relation to Data Reports, Mapping and Risk Screening Reports, the Client shall be entitled to make Reports available to (i) the Beneficiary, (ii) the Beneficiary's professional advisers, (iii) any person providing funding to the Beneficiary in relation to the Site (whether directly or as part of a lending syndicate), (iv) the first purchaser or first tenant of the Site (v) the professional advisers and lenders of the first purchaser or tenant of the Site. For the avoidance of doubt, such persons shall include any entity necessary under the Housing Act 2004 (as amended). Accordingly GroundSure shall have the same duties and obligations to those persons in respect of the Services as it has to the Client and those persons shall have the benefit of any of the Client's rights under the Contract as if those persons were parties to the Contract. For the avoidance of doubt, the limitations of GroundSure's liability as set out in condition 7 shall apply.

4.3 In relation to Consultancy Services, reliance shall be limited to the Client, Beneficiary and named parties on the Report.

4.4 Save as set out in conditions 4.2 and 4.3 and unless otherwise agreed in writing with GroundSure, any other party considering the information supplied by GroundSure as part of the Services, including (but not limited to) insurance underwriters, does so at their own risk and GroundSure has no legal obligations to such party unless otherwise agreed in writing.

4.5 The Client shall not and shall not knowingly permit any person (including the Beneficiary) who is provided with a copy of any Report shall not except as permitted herein or by separate agreement with GroundSure: (a) remove, suppress or modify any trade mark, copyright or other proprietary marking from the Report or Mapping; (b) create any product which is derived directly or indirectly from the data contained in the Report or Mapping; (c) combine the Report or Mapping with, or incorporate the Report or Mapping into any other information data or service; or (d) re-format or otherwise change (whether by modification, addition or enhancement) data or images contained in the Report or Mapping.

4.6 Notwithstanding condition 4.5, if the Client acts in a professional capacity, it may make reasonable use of a Report and/or findings made as a result of Consultancy Services to advise Beneficiaries. However, GroundSure shall have no liability in respect of any opinion or report given to such Beneficiaries by the Client or a third party.

5 Fees and Disbursements

5.1 GroundSure shall charge the Client fees at the rate and frequency specified in the Contract together, in the case of Consultancy Services, with all proper disbursements incurred by GroundSure in performing the Services. For the avoidance of doubt, the fees payable for the Services are as set out in GroundSure's written proposal, Order Website or Order acknowledgement form. The Client shall in addition pay all value added tax or other tax payable on such fees and disbursements in relation to the provision of the Services.

5.2 Unless GroundSure requires prepayment, the Client shall promptly pay all fees disbursements and other monies due to GroundSure in full without deduction, counterclaim or set off together with such value added tax or other tax as may be required within 30 days from the date of GroundSure's invoice or such other period as may be agreed in writing between GroundSure and the Client ("Payment Date"). GroundSure reserves the right to charge interest which shall accrue on a daily basis from 30 days after the date of Payment Date until the date of payment (whether before or after judgement) at the rate of five per cent per annum above the Bank of England base rate from time to time.

5.3 In the event that the Client disputes the amount payable in respect of GroundSure's invoice it shall notify GroundSure no later than 28 days after the date thereof that it is in dispute. In default of such notification the Client shall be deemed to have agreed the amount thereof. As soon as reasonably practicable following receipt of a notification in respect of any disputed invoice, a member of the management team at GroundSure shall contact the Client and the parties shall use all reasonable endeavours to resolve the dispute.

6 Intellectual Property

6.1 Subject to the provisions of condition 4.1, the Client and the Beneficiary hereby acknowledge that all Intellectual Property in the Services are and shall remain owned by either GroundSure or the Data Providers and nothing in these terms purports to transfer or assign any rights to the Client or the Beneficiary in respect of the Intellectual Property.

6.2 The Client shall acknowledge the ownership of the Content where such Content is incorporated or used in the Client's own documents, reports, systems or services whether or not these are supplied to a third party.

6.3 Data Providers may enforce any breach of condition 6.1 against the Client or Beneficiary.

7 Liability

Report Reference: CMAPS-843213

- 7.1 Nothing in these terms and conditions shall limit GroundSure's liability for causing death or personal injury through negligence or wilful default.
- 7.2 Save as otherwise set out in these conditions, any information provided by one party ("Disclosing party") to the other party ("Receiving Party") shall be treated as confidential except so far as authorised by the Disclosing Party to provide such information in whole or in part to a third party.
- 7.3 Nothing in these conditions shall affect the statutory rights of a consumer under the applicable consumer protection legislation from time to time.
- 7.4 In relation to Data Reports, Mapping and Risk Screening Reports, GroundSure's liability under the Contract shall cease upon the expiry of six years from the date when the Beneficiary became aware that it may have a claim against GroundSure in respect of the Services provided always that there shall be no liability at the expiration of twelve years from the completion of the Contract. For the avoidance of doubt, any claims in respect of which proceedings are notified to GroundSure in writing prior to the expiry of the time periods referred to in this clause shall survive the expiry of those time periods provided any such claim is actually commenced within six months of notification.
- 7.5 In relation to Consultancy Services GroundSure's liability under the Contract shall cease upon the expiry of six years from the date the Services were completed.
- 7.6 GroundSure shall not be liable to the Client or any person to whom the Client provides a copy of a Data Report, Mapping or Risk Screening Report in any circumstances whatsoever unless arising out of a breach on its part of the obligations set out in the Contract.
- 7.7 GroundSure shall not be liable if the Data Reports, Mapping or Risk Screening Report are used otherwise than as provided or referred to in these conditions and the relevant User Guide.
- 7.8 Subject to the provisions of condition 7.3, GroundSure makes no representation, warranties, express or implied, as to the accuracy, reliability, completeness, validity or fitness for purpose of any Content and shall not be liable for any omission, error or inaccuracy in relation thereto unless GroundSure should reasonably have been alerted to any omission, error or inaccuracy in the Content.
- 7.9 Subject to the provisions of clause 7.1 notwithstanding anything to the contrary contained elsewhere in the Contract, and irrespective of whether multiple parties make use of the same Services, the total liability of GroundSure under or in connection with the Contract, whether in contract in tort for breach of statutory duty or otherwise shall not exceed £5 million per claim or series of connected claims.
- 7.10 Whilst GroundSure will use all reasonable endeavours to maintain operability of its internet ordering service it will not be liable for any loss or damages caused by a delay or loss of use of such service. The Client shall use GroundSure's internet ordering service at its own risk. GroundSure shall not be responsible for any damage to a Client or permitted assignee's computer, software, modem, telephone or other property resulting from the use of GroundSure's internet ordering service.
- 7.11 The Client accepts, and shall use all reasonable endeavours to procure that anyone who is provided with a copy of the Report accepts, that it has no claim or recourse to any Data Provider or to GroundSure in respect of the acts or omissions of such Data Providers including Content supplied by them save for where a Risk Screening Report comprises part of a Home Information Pack:
- (i) the Data Providers set out in the relevant User Guide shall be responsible for the quality and accuracy of the data supplied by them; and
 - (ii) where GroundSure makes an assessment of a Site to determine if it is likely to fall within Part II(A) of the Environmental Protection Act 1990, GroundSure shall be responsible for the interpretation of any Content provided by a Data Provider subject to the limitations set out in these terms and conditions.
- 7.12 GroundSure shall provide the Services using reasonable skill and care, however, GroundSure shall not be liable for any inaccurate statement or risk rating in a Report which resulted from a reasonable interpretation of the Content.
- 7.13 Subject to the provisions of clause 7.1, GroundSure shall not be liable for any losses (whether direct or indirect) and including (but not limited to) loss of profit caused by the suspension or reduction of activity on a Site, business interruption, all third party off-Site claims or any loss in value of a Site, loss of goodwill, loss of business opportunity or other similar losses alleged to be sustained by the Client, the Beneficiary or any third party.
- 7.14 GroundSure undertakes for the duration of the liability periods referred to in conditions 7.4 and 7.5 to maintain professional indemnity insurance in respect of its liabilities in respect of the Contract for £5 million in the aggregate which amount shall first include the whole of any sum payable for death or personal injury provided such insurance is readily available at commercially viable rates or for a lesser amount to be agreed with the Client should the cost of such insurance become commercially unviable. GroundSure shall produce evidence of such insurance if requested by the Client. A greater level of cover may be available upon request and agreement with the Client.
- 8 GroundSure right to suspend or terminate
- 8.1 In the event that GroundSure reasonably believes that the Client or Beneficiary as applicable has not provided the information or assistance required to enable the proper performance of the Services, GroundSure shall be entitled on fourteen days written notice to suspend all further performance of the Services until such time as any such deficiency has been made good.
- 8.2 GroundSure may additionally terminate the Contract immediately on written notice in the event that:
- (i) the Client shall fail to pay any sum due to GroundSure within 28 days of the due date for payment; or
 - (ii) the Client (being an individual) has a bankruptcy order made against him or (being a company) shall enter into liquidation whether compulsory or voluntary or have an Administration Order made against it or if a Receiver shall be appointed over the whole or any part of its property assets or undertaking or if the Client is struck off the Register of Companies or dissolved; or
 - (iii) the Client being a company is unable to pay its debts within the meaning of Section 123 of the Insolvency Act 1986 or being an individual appears unable to pay his debts within the meaning of Section 268 of the Insolvency Act 1986 or if the Client shall enter into a composition or arrangement with the Client's creditors or shall suffer distress or execution to be levied on his goods; or
 - (iv) the Client breaches any material term of the Contract (including, but not limited to, the obligations in condition 4) incapable of remedy or if remediable, is not remedied within 14 days of notice of the breach.
- 9 Client's Right to Terminate and Suspend
- 9.1 Subject to condition 10.2, the Client may at any time after commencement of the Services by notice in writing to GroundSure require GroundSure to terminate or suspend immediately performance of all or any of the Services.
- 9.2 The Client waives all and any right of cancellation it may have under the Consumer Protection (Distance Selling) Regulations 2000 (as amended) in respect of the Order of a Report/Mapping. This does not affect the Beneficiary's statutory rights.
- 10 Consequences of Withdrawal, Termination or Suspension
- 10.1 Upon termination or any suspension of the Services, GroundSure shall take steps to bring to an end the Services in an orderly manner, vacate any Site with all reasonable speed and shall deliver to the Client/Beneficiary any property of the Client/ Beneficiary in GroundSure's possession or control.
- 10.2 In the event of termination/suspension of the Contract under conditions 8 or 9, the Client shall pay to GroundSure all and any fees payable in respect of the performance of the Services up to the date of termination/suspension. In respect of any Consultancy Services provided, the Client shall also pay GroundSure any additional costs incurred in relation to the termination/suspension of the Contract.
- 11 General
- 11.1 The mapping contained in the Services is protected by Crown copyright and must not be used for any purpose outside the context of the Services or as specifically provided in these terms.
- 11.2 GroundSure reserves the right to amend these terms and conditions. No variation to these terms shall be valid unless signed by an authorised representative of GroundSure.
- 11.3 No failure on the part of GroundSure to exercise and no delay in exercising, any right, power or provision under these terms and conditions shall operate as a waiver thereof.
- 11.4 Save as expressly provided in conditions 4.2, 4.3, 6.3 and 11.5, no person other than the persons set out therein shall have any right under the Contract (Rights of Third Parties) Act 1999 to enforce any terms of the Contract.
- 11.5 The Secretary of State for Communities and Local Government acting through Ordnance Survey, may enforce breach of conditions 6.1 or 11.1 of these terms and conditions against the Client in accordance with the provisions of the Contracts (Rights of Third Parties) Act 1999.
- 11.6 GroundSure shall not be liable to the Client if the provision of the Services is delayed or prevented by one or more of the following circumstances:
- (i) the Client or Beneficiary's failure to provide facilities, access or information;
 - (ii) fire, storm, flood, tempest or epidemic;
 - (iii) Acts of God or the public enemy;
 - (iv) riot, civil commotion or war;
 - (v) strikes, labour disputes or industrial action;
 - (vi) acts or regulations of any governmental or other agency;
 - (vii) suspension or delay of services at public registries by Data Providers; or
 - (viii) changes in law.
- 11.7 Any notice provided shall be in writing and shall be deemed to be properly given if delivered by hand or sent by first class post, facsimile or by email to the address, facsimile number or email address of the relevant party as may have been notified by each party to the other for such purpose or in the absence of such notification the last known address.
- 11.8 Such notice shall be deemed to have been received on the day of delivery if delivered by hand, facsimile or email and on the second working day after the day of posting if sent by first class post.
- 11.9 The Contract constitutes the entire contract between the parties and shall supersede all previous arrangements between the parties.
- 11.10 Each of the provisions of the Contract is severable and distinct from the others and if one or more provisions is or should become invalid, illegal or unenforceable, the validity and enforceability of the remaining provisions shall not in any way be tainted or impaired.
- 11.11 These terms and conditions shall be governed by and construed in accordance with English law and any proceedings arising out of or connected with these terms and conditions shall be subject to the exclusive jurisdiction of the English courts.
- 11.12 If the Client or Beneficiary has a complaint about the Services, notice should be given in writing to the Compliance Officer at GroundSure who will respond in a timely manner.

CENTREMAPS
Brockamin House, Leigh,
WR6 5JU

Report Reference:	CMAPS-843214
Your Reference:	Henthorn Road
Report Date	Jun 2, 2010
Report Delivery Method:	Email - pdf

GroundSure GeoInsight

Address: Henthorn Road, Clitheroe

Dear Sir/Madam,

Thank you for placing your order with GroundSure. Please find enclosed the **GroundSure GeoInsight** as requested.

If you need any further assistance, please do not hesitate to contact our helpline on 01886 832972 quoting the above CENTREMAPS reference number.

Yours faithfully,

CENTREMAPS

Enc.
GroundSure GeoInsight

GroundSure GeoInsight

Address: Henthorn Road, Clitheroe

Date: Jun 2, 2010

Report Reference: CMAPS-843214

Your Reference: Henthorn Road



Brought to you by CENTREMAPS

Aerial Photograph of Study Site



Site Name: Henthorn Road, Clitheroe
Grid Reference: 372944,440980
Size of Site: 16.35 ha

Aerial photography supplied by Getmapping PLC.
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Overview of Findings

The GroundSure GeolInsight provides high quality geo-environmental information that allows geo-environmental professionals and their clients to make informed decisions and be forewarned of potential ground instability problems that may affect the ground investigation, foundation design and possibly remediation options that could lead to possible additional costs.

The report is based on the BGS 1:50,000 Digital Geological Map of Great Britain, BGS Geosure data; BRITPITS database; Shallow Mining data and Borehole Records, Coal Authority data including brine extraction areas, PBA non-coal mining and natural cavities database and GroundSure's unique database including historical surface ground and underground workings.

For further details on each dataset, please refer to each individual section in the report as listed. Where the database has been searched a numerical result will be recorded. Where the database has not been searched '-' will be recorded.

Report Section	Number of records found within (X) m of the study site boundary
1. Geology	Description
1.1 Artificial Ground,	
1.1.1 Is there any Artificial Ground /Made Ground present beneath the study site? *	No
1.1.2 Are there any records relating to permeability of artificial ground within the study site* boundary?	No
1.2 Superficial Geology & Landslips	
1.2.1 Is there any Superficial Ground /Drift Geology present beneath the study site? *	Yes
1.2.2 Are there any records relating to permeability of superficial geology within the study site* boundary?	Yes
1.2.3 Are there any records of landslide within 500m of the study site boundary?	No
1.2.4 Are there any records relating to permeability of landslips within the study site* boundary?	No
1.3 Bedrock, Solid Geology & Faults	
1.3.1 For records of Bedrock and Solid Geology beneath the study site* see the detailed findings section.	
1.3.2 Are there any records relating to permeability of bedrock within the study site* boundary?	Yes
1.3.3 Are there any records of faults within 500m of the study site boundary?	Yes
1.3.4 Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?	The property is in a radon Affected Area, as between 1 and 3% of properties are above the Action Level
1.3.5 Is the property in an area where Radon Protection Measures are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?	No radon protective measures are necessary

* This includes an automatically generated 50m buffer zone around the site

Source: Scale 1:50,000 BGS Sheet No:068

2. Ground Workings	on-site	0-50	51-250	251-500	501-1000
2.1 Historical Surface Ground Working Features from Small Scale Mapping	5	0	2	-	-
2.2 Historical Underground Workings Features from Small Scale Mapping	0	0	0	0	0
2.3 Current Ground Workings	0	0	0	0	0

3. Mining, Extraction & Natural Cavities	on-site	0-50	51-250	251-500	501-1000
3.1 Historical Mining	0	0	0	0	0
3.2 Coal Mining	0	0	0	0	0
3.3 Non-Coal Mining*	1	0	0	0	1
3.4 Non – Coal Mining Cavities	0	0	0	0	0
3.5 Natural Cavities	0	0	0	0	0
3.6 Brine Extraction	0	0	0	0	0
3.7 Gypsum Extraction	0	0	0	0	0
3.8 Tin Mining	0	0	0	0	0
3.9 Clay Mining	0	0	0	0	0

*This includes an automatically generated 50m buffer zone around the site

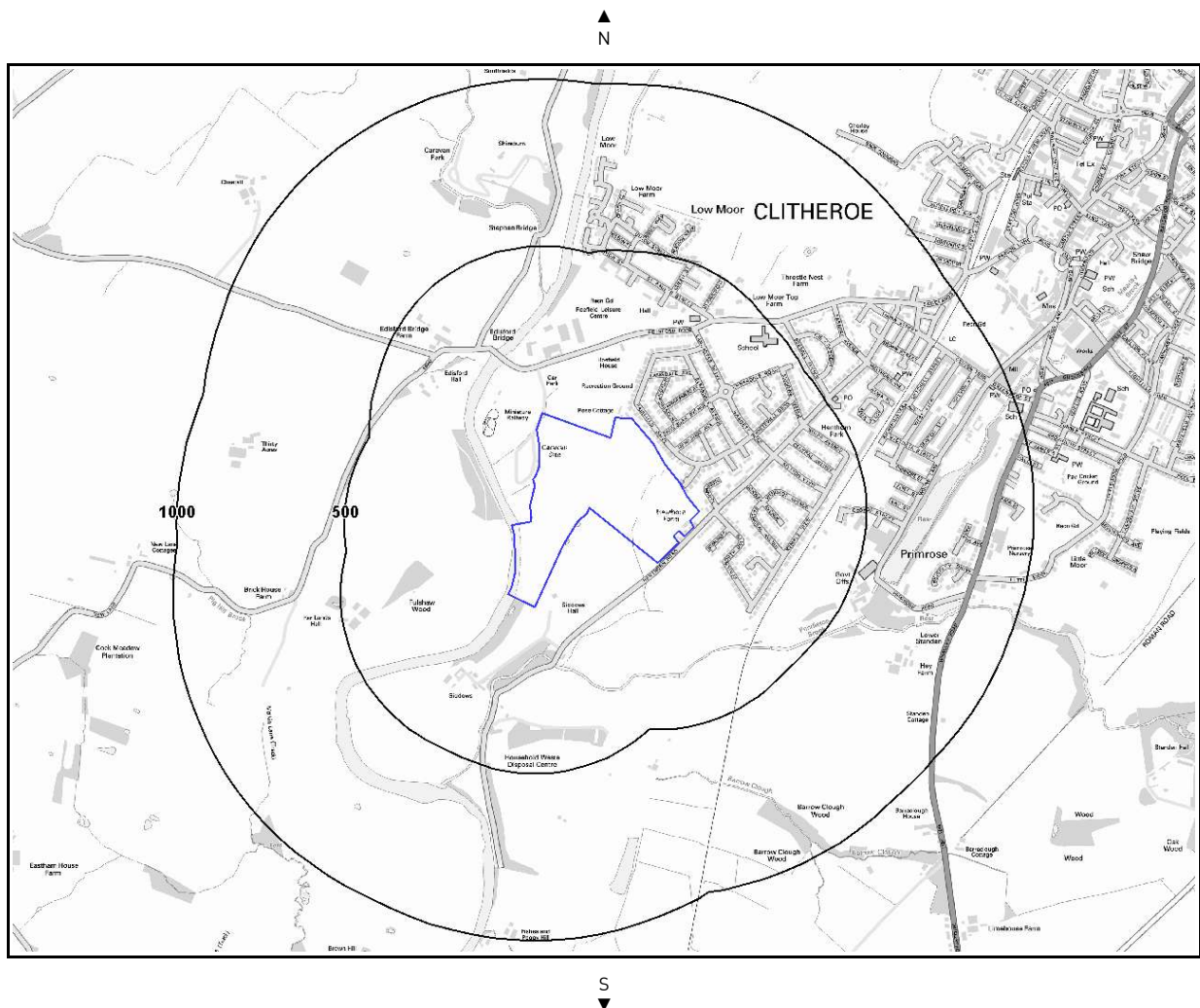
4. Natural Ground Subsidence	on-site*	0-50	51-250	251-500	501-1000
4.1 Shrink-Swell Clay	Very Low	-	-	-	-
4.2 Landslides	Low	-	-	-	-
4.3 Ground Dissolution of Soluble Rocks	Very Low	-	-	-	-
4.4 Compressible Deposits	Moderate	-	-	-	-
4.5 Collapsible Deposits	Negligible	-	-	-	-
4.6 Running Sand	Low	-	-	-	-

* This includes an automatically generated 50m buffer zone around the site

5. Borehole Records	on-site	0-50	51-250	251-500	501-1000
5.1 BGS Recorded Boreholes	0	0	0	-	-

6. Estimated Background Soil Chemistry	on-site	0-50	51-250	251-500	501-1000
6.1 Records of Background Soil Chemistry	5	1	0	-	-

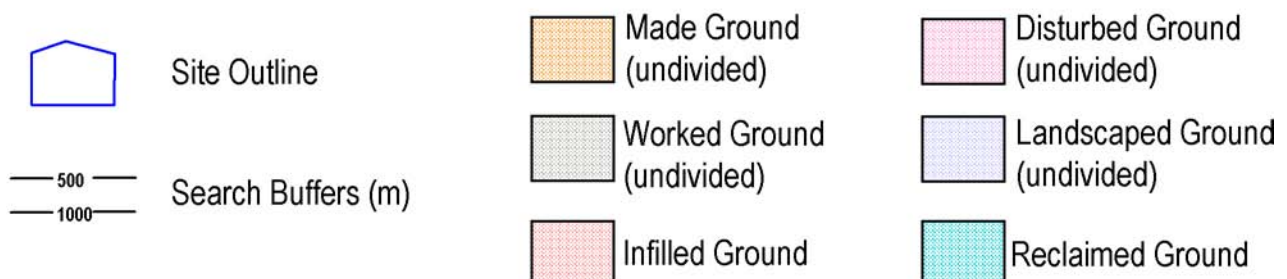
1.1 Artificial Ground Map



Artificial Ground Legend



Crown Copyright. All Rights Reserved
Licence Number: 100035207



Geological information represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

Report Reference: [CMAPS-843214](#)

Brought to you by CENTREMAPS

If you would like any further assistance regarding this report then please contact CENTREMAPS on (T) 01886 832972, (F) 01883 833485, email: groundsure@centremaps.co.uk

1.1 Artificial Ground

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:068

1.1.1 Artificial/Made Ground

Are there any records of Artificial/Made Ground within 500m of the study site boundary: **No**

Database searched and no data found.

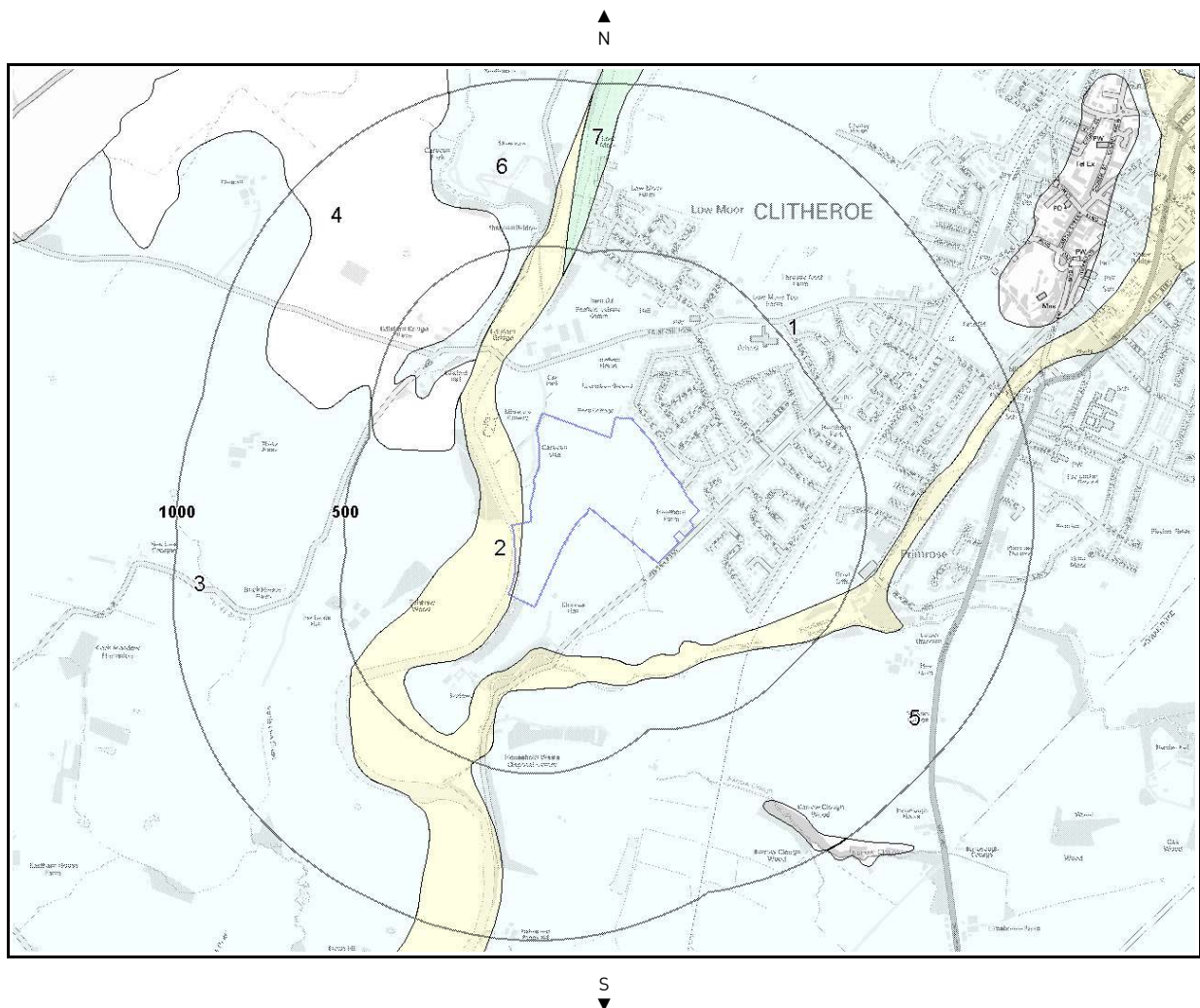
1.1.2 Permeability of Artificial Ground

Are there any records relating to permeability of artificial ground within the study site* boundary: **No**

Database searched and no data found.

* This includes an automatically generated 50m buffer zone around the site.

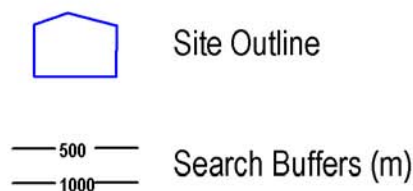
1.2 Superficial Deposits and Landslips Map



Superficial and Landslips Legend



Crown Copyright. All Rights Reserved
Licence Number: 100035207



Geological information represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

1.2 Superficial Deposits and Landslips

1.2.1 Superficial Deposits/Drift Geology

Are there any records of Superficial Deposits/Drift Geology within 500m of the study site boundary:

Yes

ID	Distance (m)	Direction	Lex Code	Description	Rock Description
1	0.0	On Site	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
2	0.0	On Site	ALV-CSSG	ALLUVIUM	CLAY, SILT, SAND AND GRAVEL
3	105.0	W	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
4	241.0	NW	GLLDD-CLSI	GLACIOLACUSTRINE DEPOSITS, DEVENSIAN	CLAY AND SILT
5	245.0	S	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
6	254.0	NW	TILLD-DMTN	TILL, DEVENSIAN	DIAMICTON
7	416.0	N	HMGDD-DMTN	HUMMOCKY (MOUNDY) GLACIAL DEPOSITS, DEVENSIAN	DIAMICTON

1.2.2 Permeability of Superficial Ground

Are there any records relating to permeability of superficial ground within the study site* boundary:

Yes

Distance (m)	Direction	Flow type	Maximum Permeability	Minimum Permeability
0.0	On Site	Mixed	High	Low
0.0	On Site	Intergranular	High	Very Low

1.2.3 Landslip

Database searched and no data found.

Are there any records of Landslip within 500m of the study site boundary?

No

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discreet layers, these are: Artificial / Made Ground, Superficial / Drift Geology and Landslips. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

1.2.4 Landslip Permeability

Are there any records relating to permeability of landslips within the study site* boundary:

No

Database searched and no data found.

* This includes an automatically generated 50m buffer zone around the site.

1.3 Bedrock and Faults Map



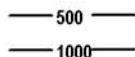
Bedrock & Faults Deposits Legend



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Site Outline



Search Buffers (m)

Geological information represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

1.3 Bedrock, Solid Geology & Faults

The following geological information represented on the mapping is derived from 1:50,000 scale BGS Geological mapping, Sheet No:068

1.3.1 Bedrock/Solid Geology

Records of Bedrock/Solid Geology within 500m of the study site boundary:

ID	Distance (m)	Direction	LEX Code	Rock Description	Rock Age
1	0.0	On Site	CLHOM-MDST	Clitheroe Limestone Formation And Hodder Mudstone Formation (undifferentiated) - Mudstone	Holkerian / Chadian
2	214.0	SE	PRMT-STMD	Permian Rocks And Triassic Rocks (undifferentiated) - Sandstone And Mudstone	Triassic / Permian
3	469.0	N	PRMT-STMD	Permian Rocks And Triassic Rocks (undifferentiated) - Sandstone And Mudstone	Triassic / Permian

1.3.2 Permeability of Bedrock Ground

Are there any records relating to permeability of bedrock ground within the study site* boundary:

Yes

Distance (m)	Direction	Flow type	Maximum Permeability	Minimum Permeability
0.0	On Site	Fracture	Low	Low

1.3.3 Faults

Are there any records of Faults within 500m of the study site boundary?

Yes

ID	Distance (m)	Direction	Category Description	Feature Description
7A	40.0	SE	FAULT	Normal fault, inferred
8A	40.0	SE	FAULT	Normal fault, inferred

The geology map for the site and surrounding area are extracted from the BGS Digital Geological Map of Great Britain at 1:50,000 scale.

This Geology shows the main components as discreet layers, these are: Bedrock/ Solid Geology and linear features such as Faults. These are all displayed with the BGS Lexicon code for the rock unit and BGS sheet number. Not all of the main geological components have nationwide coverage.

1.3.4 Radon Affected Areas

Is the property in a Radon Affected Area as defined by the Health Protection Agency (HPA) and if so what percentage of homes are above the Action Level?

The property is in a radon Affected Area, as between 1 and 3% of properties are above the Action Level

1.3.5 Radon Protection

Is the property in an area where Radon Protection are required for new properties or extensions to existing ones as described in publication BR211 by the Building Research Establishment?

* This includes an automatically generated 50m buffer zone around the site.

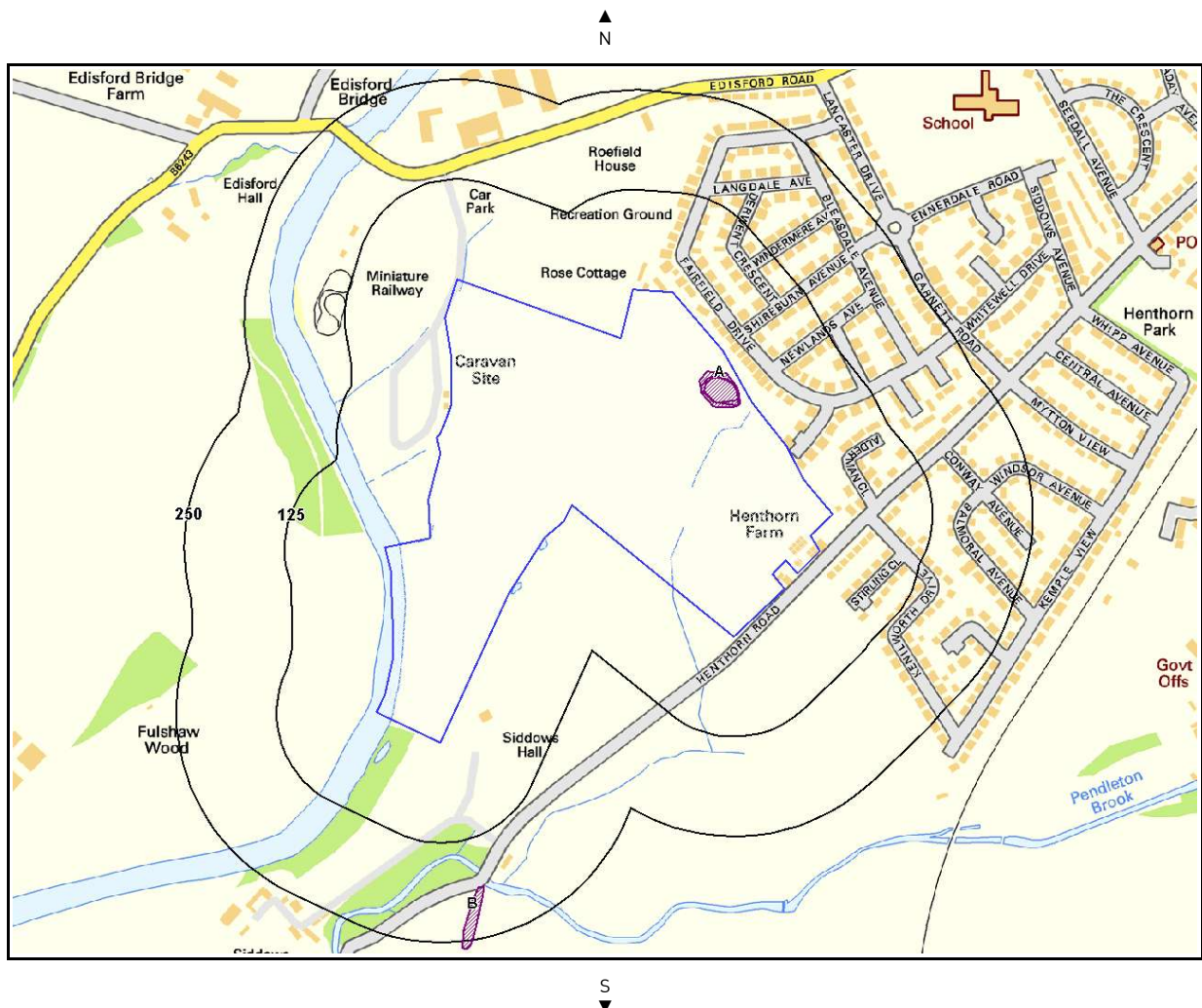
Report Reference: [CMAPS-843214](#)

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If you would like any further assistance regarding this report then please contact CENTREMAYS on (T) 01886 832972, (F) 01883 833485, email: groundsure@centremaps.co.uk

No radon protective measures are necessary

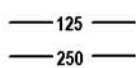
2. Ground Workings Map



Ground Workings Legend



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-  Site Outline
-  Search Buffers (m)
-  Historic Surface Ground Workings
-  Historic Underground Workings
-  Current Ground Workings

2. Ground Workings

2.1 Historical Surface Ground Working Features derived from the Historical Mapping

This dataset is based on GroundSure's unique Historical Land Use Database derived from 1:10,560 and 1:10,000 scale historical mapping.

Are there any Historical Surface Ground Working Features within 250m of the study site boundary? **Yes**

The following Historical Surface Ground Working Features are provided by GroundSure:

ID	Distance (m)	Direction	NGR	Use	Date
1A	0.0	On Site	373088,441135	Unspecified Old Quarry	1911
2A	0.0	On Site	373091,441130	Unspecified Pit	1950
3A	0.0	On Site	373088,441129	Unspecified Pit	1930
4A	0.0	On Site	373088,441129	Unspecified Pit	1938
5A	0.0	On Site	373088,441129	Unspecified Pit	1910
6B	187.0	S	372780,440470	Unspecified Heap	1938
7B	187.0	S	372780,440470	Unspecified Heap	1930

2.2 Historical Underground Workings Features derived from the Historical Mapping

This data is derived from the GroundSure unique Historical Land Use Database. It contains data derived from 1:10,000 and 1:10,560 historical Ordnance Survey Mapping and includes some natural topographical features (Shake Holes for example) as well as manmade features that may have implications for ground stability. Underground and mining features have been identified from surface features such as shafts. The distance that these extend underground is not shown.

Are there any Historical Underground Working Features within 1000m of the study site boundary? **No**

Database searched and no data found.

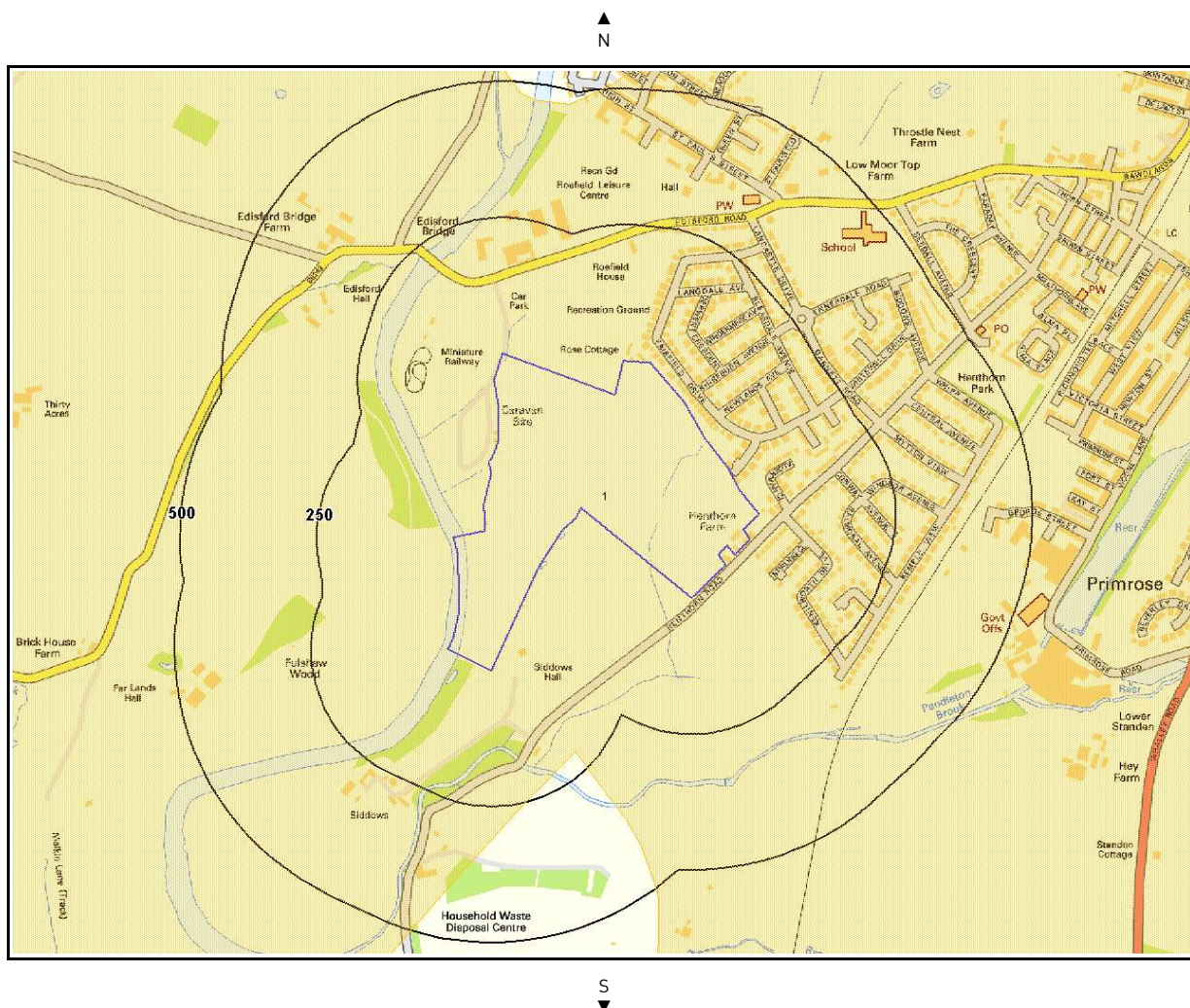
2.3 Current Ground Workings

This dataset is derived from the BGS BRITPITS database covering active; inactive mines; quarries; oil wells; gas wells and mineral wharves; and rail deposits throughout the British Isles.

Are there any BGS Current Ground Workings within 1000m of the study site boundary? **No**

Database searched and no data found.

3. Mining, Extraction & Natural Cavities Map



Mining, Extraction & Natural Cavities Legend

Enabled by Ordnance Survey

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3. Mining, Extraction & Natural Cavities

3.1 Historical Mining

This dataset is derived from GroundSure unique Historical Land-use Database that are indicative of mining or extraction activities.

Are there any Historical Mining areas within 1000m of the study site boundary?

No

Database searched and no data found.

3.2 Coal Mining

This dataset provides information as to whether the study site lies within a known coal mining affected area as defined by the coal authority.

Are there any Coal Mining areas within 1000m of the study site boundary?

No

Database searched and no data found.

3.3 Non – Coal Mining

This dataset provides information as to whether the study site lies within an area which may have been subject to non-coal historic mining.

Are there any Non-Coal Mining areas within 1000m of the study site boundary?

Yes

The following non-coal mining information is provided by the BGS:

ID	Distance (m)	Direction	Name	Commodity	Assessment of likelihood
1	0.0	On Site	Not given	Vein Mineral	Unlikely - Some small scale mining may have occurred but restricted in extent.
Not shown	739.0	S	Not given	Vein Mineral	Unlikely - Some small scale mining may have occurred but restricted in extent.

3.4 Non – Coal Mining Cavities

This dataset provides information from the Peter Brett Associates (PBA) mining cavities database (compiled for the national study entitled "Review of mining instability in Great Britain, 1990" PBA has also continued adding to this database) on mineral extraction by mining.

Are there any Non-Coal Mining cavities within 1000m of the study site boundary?

No

Database searched and no data found.

3.5 Natural Cavities

This dataset provides information based on Peter Brett Associates natural cavities database.

Are there any Natural Cavities within 1000m of the study site boundary?

No

Database searched and no data found.

3.6 Brine Extraction

This dataset provides information from the Brine compensation board which has been discontinued and is now covered by the Coal Authority.

Are there any Brine Extraction areas within 1000m of the study site boundary?

No

Database searched and no data found.

3.7 Gypsum Extraction

This dataset provides information on Gypsum extraction from British Gypsum records.

Are there any Gypsum Extraction areas within 1000m of the study site boundary?

No

Database searched and no data found.

3.8 Tin Mining

This dataset provides information on tin mining areas and is derived from tin mining records. This search is based upon postcode information to a sector level. More detailed information on potential Tin Mining may be found in Section 3.3 – Non-Coal Mining Hazards.

Are there any Tin Mining areas within 1000m of the study site boundary?

No

Database searched and no data found.

3.9 Clay Mining

This dataset provides information on Kaolin and Ball Clay mining from relevant mining records.

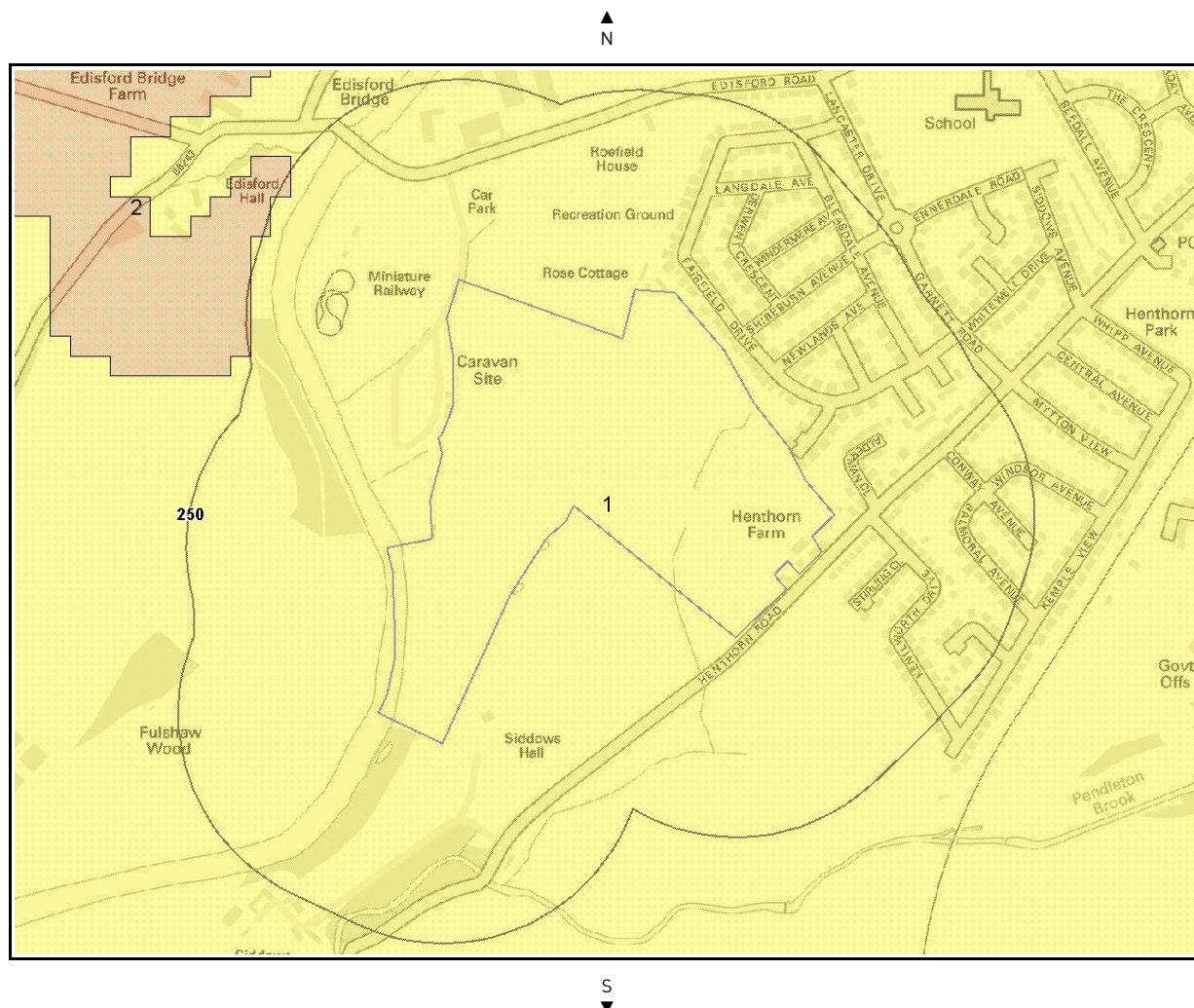
Are there any Clay Mining areas within 1000m of the study site boundary?

No

Database searched and no data found.

4. Natural Ground Subsidence

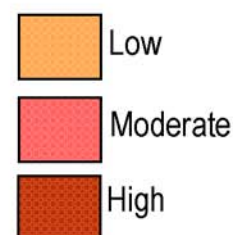
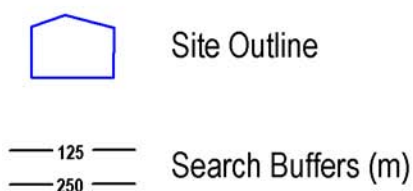
4.1 Shrink-Swell Clay Map



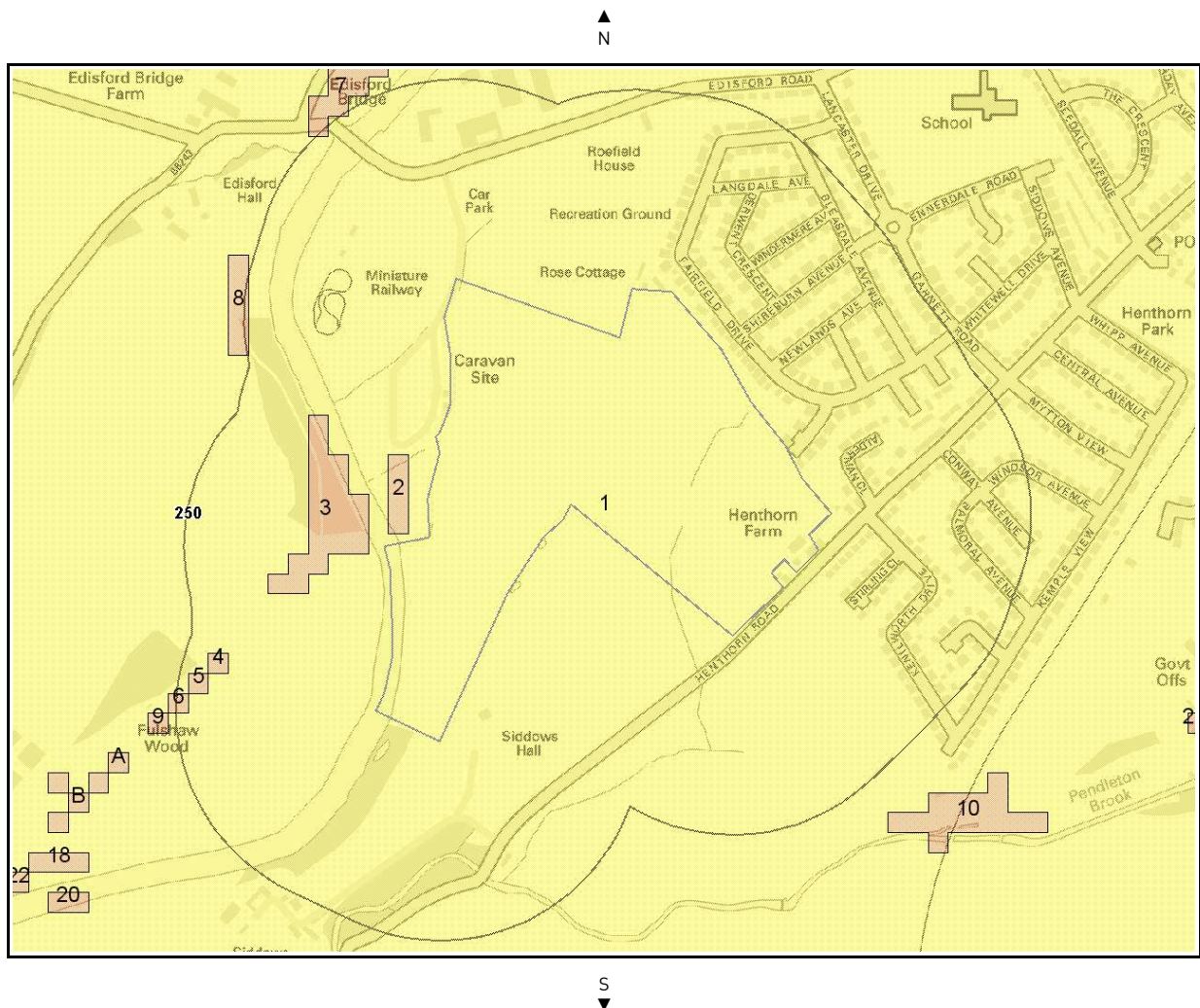
Shrink-Swell Clay Legend



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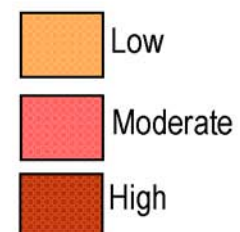
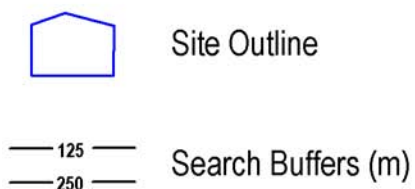
4.2 Landslides Map



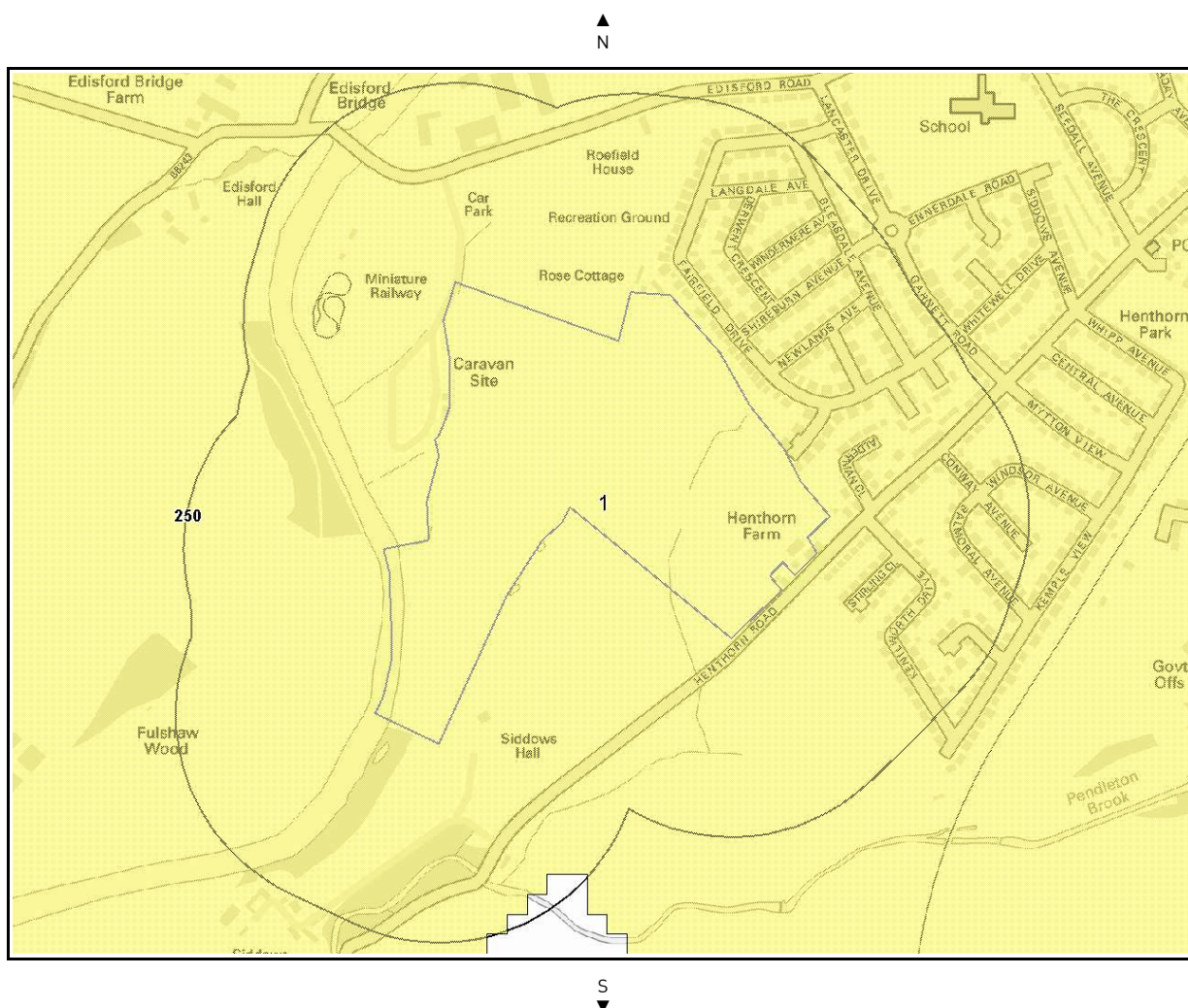
Landslides Legend



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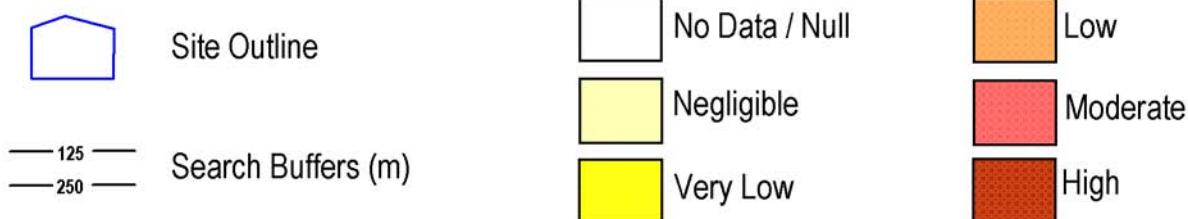
4.3 Ground Dissolution Soluble Rocks Map



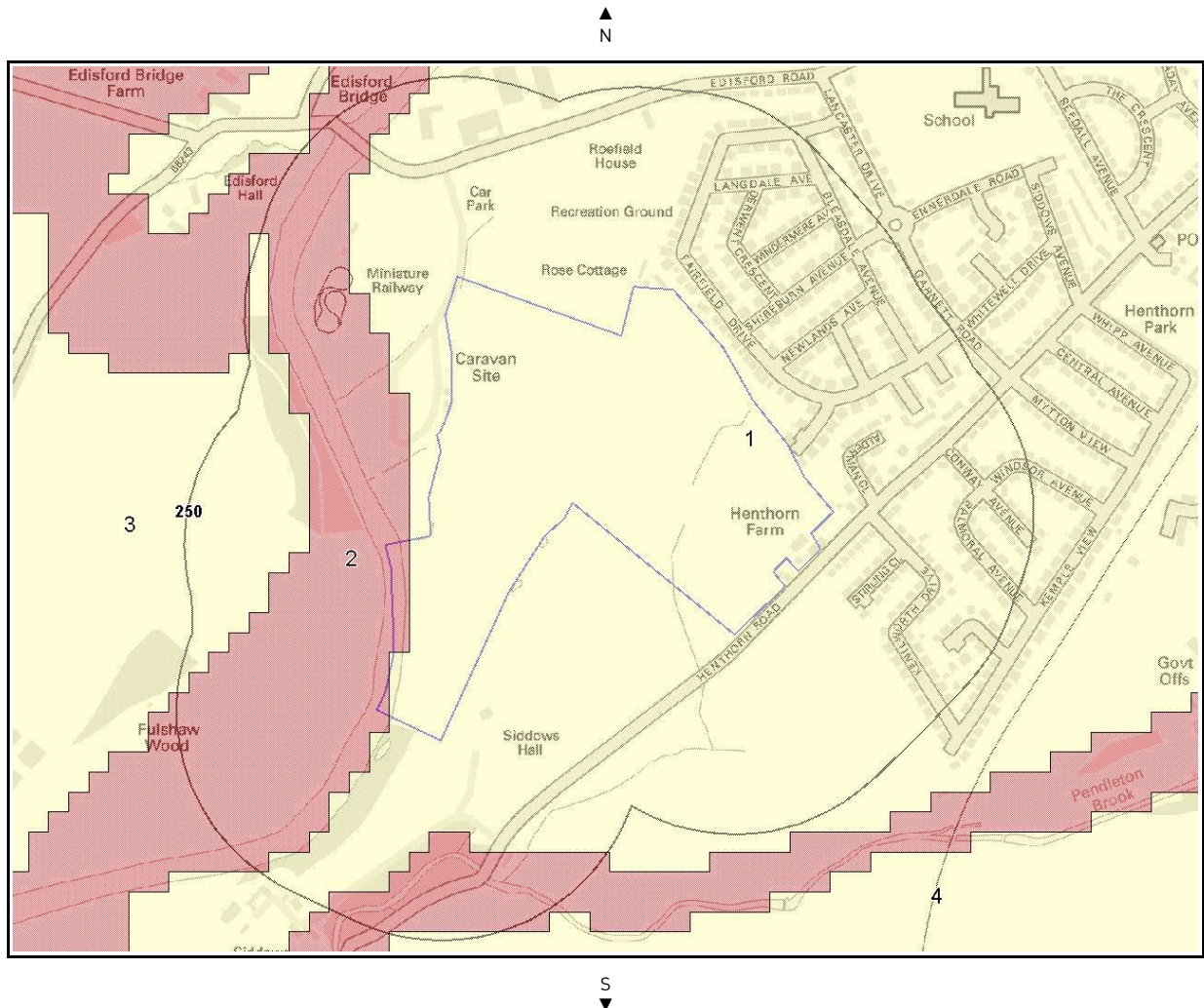
Ground Dissolution Soluble Rocks Legend

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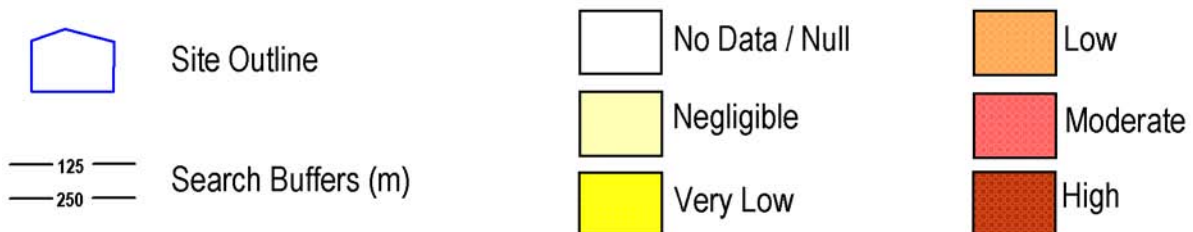
4.4 Compressible Deposits Map



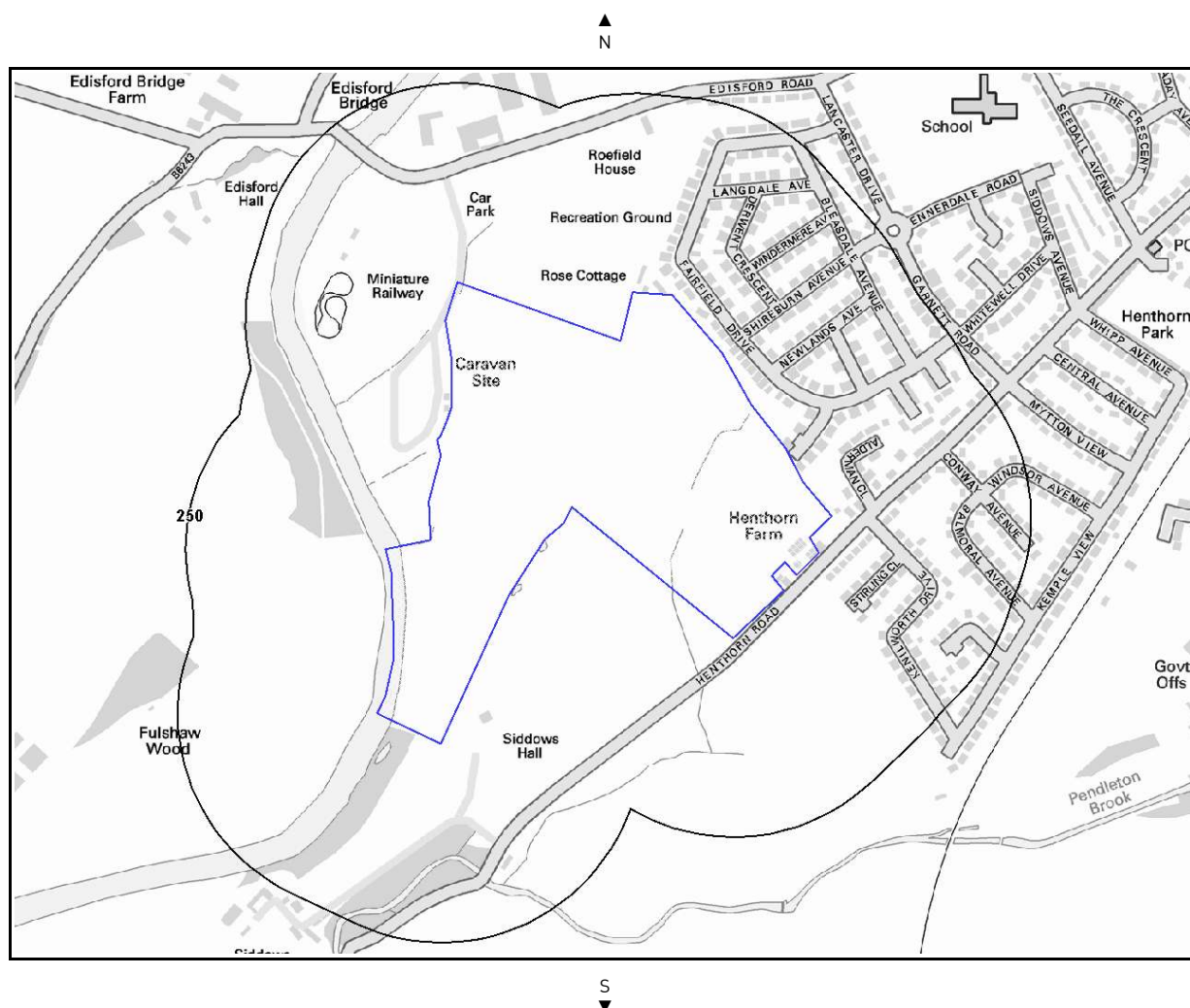
Compressible Deposits Legend



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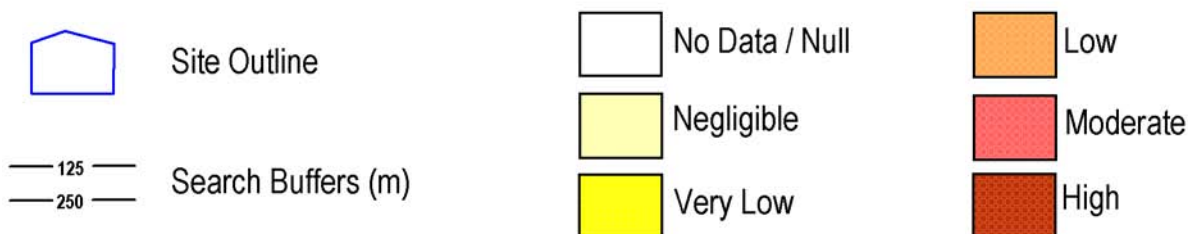
4.5 Collapsible Deposits Map



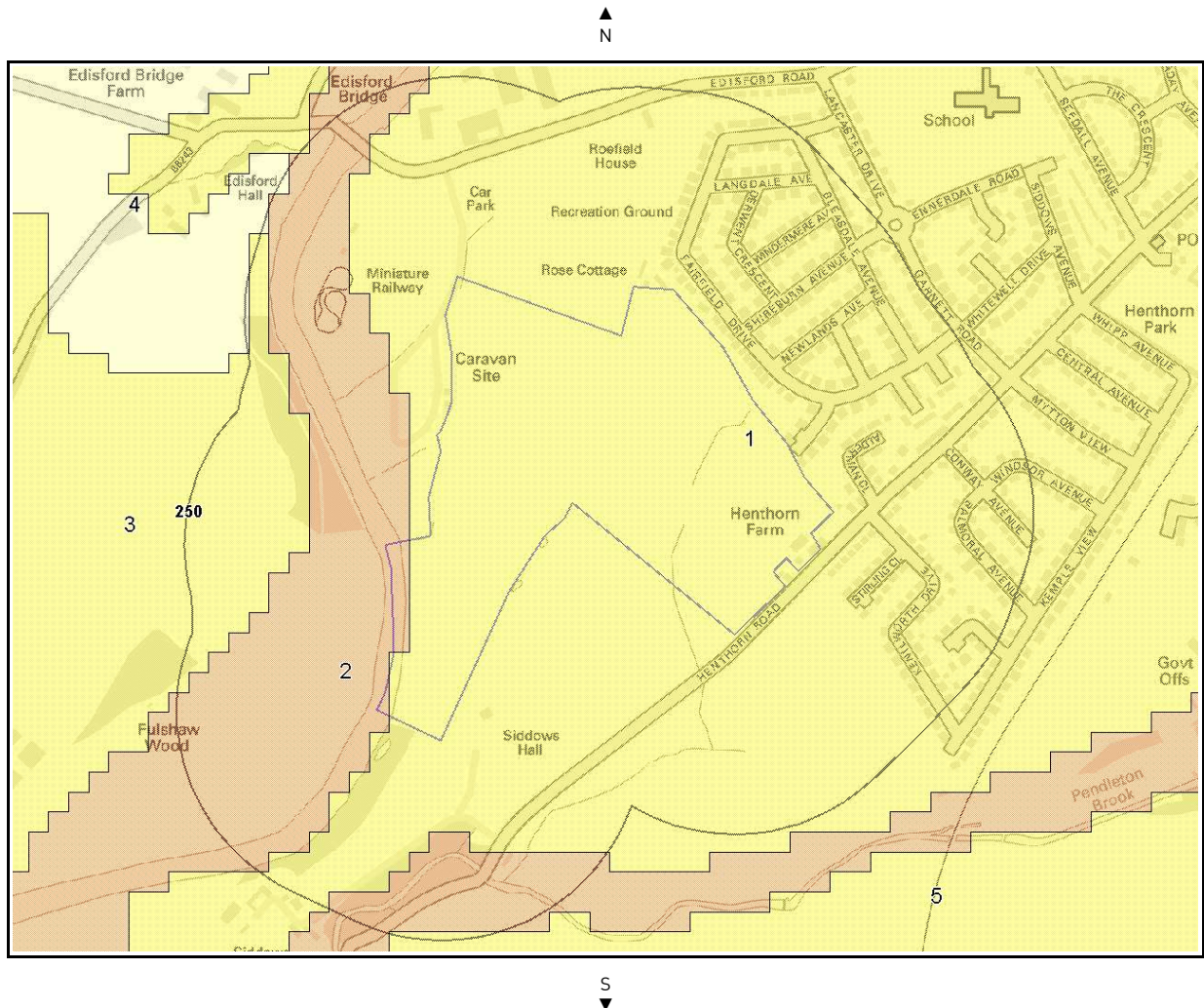
Collapsible Deposits Legend

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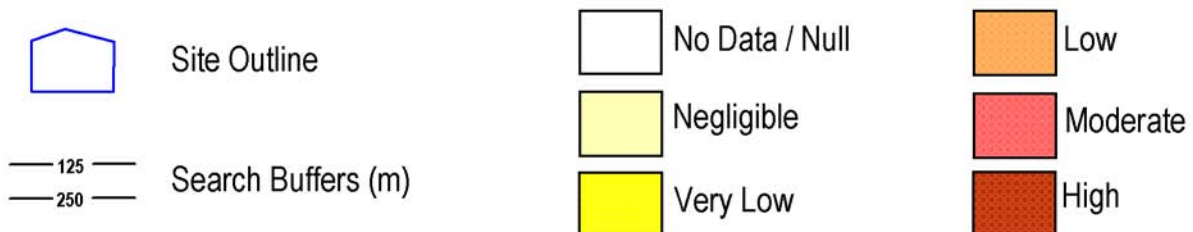
4.6 Running Sand Map



Running Sand Legend



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4. Natural Ground Subsidence

The National Ground Subsidence rating is obtained through the 6 natural ground stability hazard datasets, which are supplied by the British Geological Survey (BGS)

The following GeoSure data represented on the mapping is derived from the BGS Digital Geological map of Great Britain at 1:50,000 scale.

What is the maximum hazard rating of natural subsidence within the study site* boundary?

Moderate

*This includes an automatically generated 50m buffer zone around the study site boundary.

4.1 Shrink – Swell Clays

The following Shrink Swell information provided by the British Geological Survey:

ID	Distance (m)*	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Ground conditions predominantly low plasticity. No special actions required to avoid problems due to shrink-swell clays. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with shrink-swell clays.

4.2 Landslides

The following Landslides information provided by the British Geological Survey:

ID	Distance (m)*	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Slope instability problems are unlikely to be present. No special actions required to avoid problems due to landslides. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with landslides.
2	9.0	N	Low	Possibility of slope instability problems after major changes in ground conditions. Consideration should be given to stability if changes to drainage or excavations take place. Possible increase in construction cost to reduce potential slope stability problems. Existing property – no significant increase in insurance risk due to natural slope instability problems.
3	20.0	W	Low	Possibility of slope instability problems after major changes in ground conditions. Consideration should be given to stability if changes to drainage or excavations take place. Possible increase in construction cost to reduce potential slope stability problems. Existing property – no significant increase in insurance risk due to natural slope instability problems.

4.3 Ground Dissolution of Soluble Rocks

The following Soluble Rocks information provided by the British Geological Survey:

ID	Distance (m)*	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Significant soluble rocks are present. Problems unlikely except with considerable surface or subsurface water flow. No special actions required to avoid problems due to soluble rocks. No special ground investigation required or increased construction costs are likely. An increase in financial risk due to potential problems with soluble rocks is unlikely.

4.4 Compressible Deposits

The following Compressible Ground information provided by the British Geological Survey:

ID	Distance (m)*	Direction	Hazard Rating	Details
1	0.0	On Site	Negligible	No indicators for compressible deposits identified. No special actions required to avoid problems due to compressible deposits. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with compressible deposits.

2	0.0	On Site	Moderate	Significant potential for compressibility problems. Avoid large differential loadings of ground. Do not drain or de-water ground near the property without technical advice. For new build – consider possibility of compressible ground in ground investigation, construction and building design. Consider effects of groundwater changes. Extra construction costs are likely. For existing property – possible increase in insurance risk from compressibility, especially if water conditions or loading of the ground change significantly.
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4.5 Collapsible Deposits

The following Collapsible Rocks information is provided by the British Geological Survey:

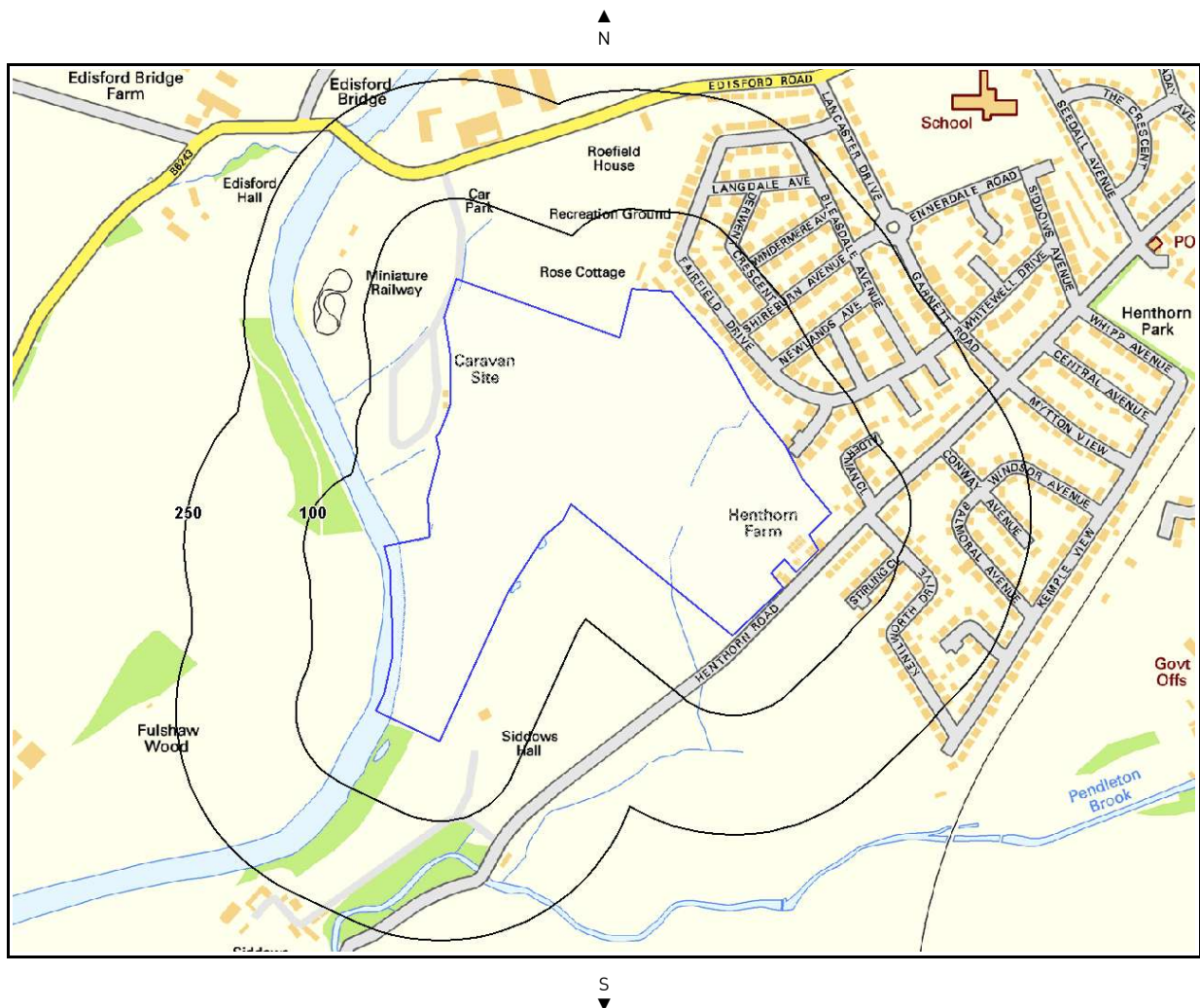
Distance (m)*	Direction	Hazard Rating	Details
0	On site	Null-Negligible	No Indicators for collapsible deposits identified. No Special actions required to avoid problems due to collapsible deposit.

4.6 Running Sands

The following Running Sands information is provided by the British Geological Survey:

ID	Distance (m)*	Direction	Hazard Rating	Details
1	0.0	On Site	Very Low	Very low potential for running sand problems if water table rises or if sandy strata are exposed to water. No special actions required, to avoid problems due to running sand. No special ground investigation required, and increased construction costs or increased financial risks are unlikely due to potential problems with running sand.
2	0.0	On Site	Low	Possibility of running sand problems after major changes in ground conditions. Normal maintenance to avoid leakage of water-bearing services or water bodies (ponds, swimming pools) should reduce likelihood of problems due to running sand. For new build – consider possibility of running sand into trenches or excavations if water table is high or sandy strata are exposed to water. Avoid concentrated water inputs to site. Unlikely to be an increase in construction costs due to potential for running sand. For existing property – no significant increase in insurance risk due to running sand problems is likely.

5. Borehole Records Map



Borehole Records Legend



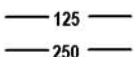
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Site Outline



Borehole Locations



Search Buffers (m)

5. Borehole Records

The systematic analysis of data extracted from the BGS Borehole Records database provides the following information.

Records of bore holes within 250m of the study site boundary:

0

Database searched and no data found.

6. Estimated Background Soil Chemistry

Records of background estimated soil chemistry within 250m of the study site boundary:

Yes

Distance (m)*	Direction	Sample Type	Estimated Geometric Mean Soil Concentrations (mg/kg)				
			Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Nickel (Ni)	Lead (Pb)
0.0	On Site	Sediment	←15 mg/kg	←1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	←150 mg/kg
0.0	On Site	Sediment	←15 mg/kg	←1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	←150 mg/kg
0.0	On Site	Sediment	15 - 25 mg/kg	←1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	←150 mg/kg
0.0	On Site	Sediment	←15 mg/kg	←1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	←150 mg/kg
0.0	On Site	Sediment	15 - 25 mg/kg	←1.8 mg/kg	60 - 90 mg/kg	15 - 30 mg/kg	←150 mg/kg
23.0	W	Sediment	←15 mg/kg	←1.8 mg/kg	40 - 60 mg/kg	15 - 30 mg/kg	←150 mg/kg

*As this data is based upon underlying 1:50,000 scale geological information, a 50m buffer has been added to this data.

Contacts

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BGS Geological Hazards Reports and general geological
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Acknowledgements

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Standard Terms and Conditions

1 Definitions

In these conditions unless the context otherwise requires:

"Beneficiary" means the Client or the customer of the Client for whom the Client has procured the Services.

"Commission" means an order for Consultancy Services submitted by a Client.

"Consultancy Services" mean consultancy services provided by GroundSure including, without limitation, carrying out interpretation of third party and in-house environmental data, provision of environmental consultancy advice, undertaking environmental audits and assessments, Site investigation, Site monitoring and related items.

"Content" means any data, database or other information contained in a Report or Mapping which is provided to GroundSure by a Data Provider.

"Contract" means the contract between GroundSure and the Client for the performance of the Services which arises upon GroundSure's acceptance of an Order or Commission and which shall incorporate these conditions, the relevant GroundSure User Guide, proposal by GroundSure and the content of any subsequent report, and any agreed amendments in accordance with condition 11.

"Client" means the party that submits an Order or Commission.

"Data Provider" means any third party providing Content to GroundSure.

"Data Report" means reports comprising factual data with no professional interpretation in respect of the level of likely risk and/or liability available from GroundSure.

"GroundSure" means GroundSure Limited, a company registered in England and Wales under number 03421028 and whose registered office is at Greater London House, Hampstead Road, London NW1 7EJ.

"Home Information Pack" means a combination of reports required when selling a residential property.

"Intellectual Property" means any patent, copyright, design rights, service marks, moral rights, data protection rights, know-how, trade mark or any other intellectual property rights.

"Mapping" an historical map or a combination of historical maps of various ages, time periods and scales available from GroundSure.

"Order" means an order form submitted by the Client requiring Services from GroundSure in respect of a specified Site.

"Order Website" means online platform via which Orders may be placed.

"Report" means a Risk Screening Report or Data Report for commercial or residential property available from GroundSure relating to the Site prepared in accordance with the specifications set out in the relevant User Guide.

"Risk Screening Report" means one of GroundSure's risk screening reports such as GroundSure Homebuyers, GroundSure Home Environmental GroundSure SiteGuard, GroundSure Screening, GroundSure Review, GroundSure Developer Review, or any other risk screening report available from GroundSure.

"Services" means the provision of any Report, Mapping or Consultancy Services which GroundSure has agreed to carry out for the Client/Beneficiary on these terms and conditions in respect of the Site.

"Site" means the landsite in respect of which GroundSure provides the Services.

"User Guide" means the relevant current version of the user guide, available upon request from GroundSure.

2 Scope of Services

2.1 GroundSure agrees to carry out the Services in accordance with the Contract and to the extent set out therein.

2.2 GroundSure shall exercise all the reasonable skill, care and diligence to be expected of experienced environmental consultants in the performance of the Services.

2.3 The Client acknowledges that it has not relied on any statement or representation made by or on behalf of GroundSure which is not set out and expressly agreed in the Contract.

2.4 Terms and conditions appearing on a Client's order form, printed stationery or other communication, including invoices, to GroundSure, its employees, servants, agents or other representatives or any terms implied by custom, practice or course of dealing shall be of no effect and these terms and conditions shall prevail over all others.

2.5 In the event that a Client/Beneficiary opts to take out insurance in conjunction with or as a result of the Services, such insurance shall be subject solely to the terms of any policy issued to it in that respect and GroundSure will have no liability therefore.

2.6 GroundSure's quotations/proposals are valid for a period of 30 days only. GroundSure reserves the right to withdraw any quotation at any time before GroundSure accepts an Order or Commission. GroundSure's acceptance of an Order or Commission shall be effective only where such acceptance is in writing and signed by GroundSure's authorised representative or where accepted via GroundSure's Order Website.

3 The Client's obligations

3.1 The Client shall be solely responsible for ensuring that the Report/Mapping ordered is appropriate and suitable for the Beneficiary's needs.

3.2 The Client shall (or shall procure that the Beneficiary shall) supply to GroundSure as soon as practicable and without charge all information necessary and accurate relevant data including any specific and/or unusual environmental information relating to the Site known to the Client/Beneficiary which may pertain to the Services and shall give such assistance as GroundSure shall reasonably require in the performance of the Services (including, without limitation, access to a Site, facilities and equipment as agreed in the Contract).

3.3 Where Client/Beneficiary approval or decision is required, such approval or decision shall be given or procured in reasonable time as not to delay or disrupt the performance of any other part of the Services.

3.4 The Client shall not and shall not knowingly permit the Beneficiary to, save as expressly permitted by these terms and conditions, re-sell, alter, add to, amend or use out of context the content of any Report, Mapping or, in respect of any Services, information given by GroundSure. For the avoidance of doubt, the Client and Beneficiary may make the Report, Mapping or GroundSure's findings available to a third party, but such third party cannot rely on the same unless expressly permitted under condition 4.

3.5 The Client is responsible for maintaining the confidentiality of its user name and password if using GroundSure's internet ordering service and accepts responsibility for all activity that occurs under such account and password.

4 Reliance

4.1 Upon full payment of all relevant fees and subject to the provisions of these terms and conditions, the Client and Beneficiary are granted an irrevocable royalty-free licence to use the information contained in the Report, Mapping or in a report prepared by GroundSure in respect of or arising out of the Consultancy Services. The Services may only be used for the benefit of the Client and those persons listed in conditions 4.2 and 4.3.

4.2 In relation to Data Reports, Mapping and Risk Screening Reports, the Client shall be entitled to make Reports available to (i) the Beneficiary, (ii) the Beneficiary's professional advisers, (iii) any person providing funding to the Beneficiary in relation to the Site (whether directly or as part of a lending syndicate), (iv) the first purchaser or first tenant of the Site (v) the professional advisers and lenders of the first purchaser or tenant of the Site. For the avoidance of doubt, such persons shall include any entity necessary under the Housing Act 2004 (as amended). Accordingly GroundSure shall have the same duties and obligations to those persons in respect of the Services as it has to the Client and those persons shall have the benefit of any of the Client's rights under the Contract as if those persons were parties to the Contract. For the avoidance of doubt, the limitations of GroundSure's liability as set out in condition 7 shall apply.

4.3 In relation to Consultancy Services, reliance shall be limited to the Client, Beneficiary and named parties on the Report.

4.4 Save as set out in conditions 4.2 and 4.3 and unless otherwise agreed in writing with GroundSure, any other party considering the information supplied by GroundSure as part of the Services, including (but not limited to) insurance underwriters, does so at their own risk and GroundSure has no legal obligations to such party unless otherwise agreed in writing.

4.5 The Client shall not and shall not knowingly permit any person (including the Beneficiary) who is provided with a copy of any Report shall not except as permitted herein or by separate agreement with GroundSure: (a) remove, suppress or modify any trade mark, copyright or other proprietary marking from the Report or Mapping; (b) create any product which is derived directly or indirectly from the data contained in the Report or Mapping; (c) combine the Report or Mapping with, or incorporate the Report or Mapping into any other information data or service; or (d) re-format or otherwise change (whether by modification, addition or enhancement) data or images contained in the Report or Mapping.

4.6 Notwithstanding condition 4.5, if the Client acts in a professional capacity, it may make reasonable use of a Report and/or findings made as a result of Consultancy Services to advise Beneficiaries. However, GroundSure shall have no liability in respect of any opinion or report given to such Beneficiaries by the Client or a third party.

5 Fees and Disbursements

5.1 GroundSure shall charge the Client fees at the rate and frequency specified in the Contract together, in the case of Consultancy Services, with all proper disbursements incurred by GroundSure in performing the Services. For the avoidance of doubt, the fees payable for the Services are as set out in GroundSure's written proposal, Order Website or Order acknowledgement form. The Client shall in addition pay all value added tax or other tax payable on such fees and disbursements in relation to the provision of the Services.

5.2 Unless GroundSure requires prepayment, the Client shall promptly pay all fees disbursements and other monies due to GroundSure in full without deduction, counterclaim or set off together with such value added tax or other tax as may be required within 30 days from the date of GroundSure's invoice or such other period as may be agreed in writing between GroundSure and the Client ("Payment Date"). GroundSure reserves the right to charge interest which shall accrue on a daily basis from 30 days after the date of Payment Date until the date of payment (whether before or after judgement) at the rate of five per cent per annum above the Bank of England base rate from time to time.

5.3 In the event that the Client disputes the amount payable in respect of GroundSure's invoice it shall notify GroundSure no later than 28 days after the date thereof that it is in dispute. In default of such notification the Client shall be deemed to have agreed the amount thereof. As soon as reasonably practicable following receipt of a notification in respect of any disputed invoice, a member of the management team at GroundSure shall contact the Client and the parties shall use all reasonable endeavours to resolve the dispute.

6 Intellectual Property

6.1 Subject to the provisions of condition 4.1, the Client and the Beneficiary hereby acknowledge that all Intellectual Property in the Services are and shall remain owned by either GroundSure or the Data Providers and nothing in these terms purports to transfer or assign any rights to the Client or the Beneficiary in respect of the Intellectual Property.

6.2 The Client shall acknowledge the ownership of the Content where such Content is incorporated or used in the Client's own documents, reports, systems or services whether or not these are supplied to a third party.

6.3 Data Providers may enforce any breach of condition 6.1 against the Client or Beneficiary.

Report Reference: **CMAPS-843214**

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7. Liability

- 7.1 Nothing in these terms and conditions shall limit GroundSure's liability for causing death or personal injury through negligence or wilful default.
- 7.2 Save as otherwise set out in these conditions, any information provided by one party ("Disclosing party") to the other party ("Receiving Party") shall be treated as confidential except so far as authorised by the Disclosing Party to provide such information in whole or in part to a third party.
- 7.3 Nothing in these conditions shall affect the statutory rights of a consumer under the applicable consumer protection legislation from time to time.
- 7.4 In relation to Data Reports, Mapping and Risk Screening Reports, GroundSure's liability under the Contract shall cease upon the expiry of six years from the date when the Beneficiary became aware that it may have a claim against GroundSure in respect of the Services provided always that there shall be no liability at the expiration of twelve years from the completion of the Contract. For the avoidance of doubt, any claims in respect of which proceedings are notified to GroundSure in writing prior to the expiry of the time periods referred to in this clause shall survive the expiry of those time periods provided any such claim is actually commenced within six months of notification.
- 7.5 In relation to Consultancy Services GroundSure's liability under the Contract shall cease upon the expiry of six years from the date the Services were completed.
- 7.6 GroundSure shall not be liable to the Client or any person to whom the Client provides a copy of a Data Report, Mapping or Risk Screening Report in any circumstances whatsoever unless arising out of a breach on its part of the obligations set out in the Contract.
- 7.7 GroundSure shall not be liable if the Data Reports, Mapping or Risk Screening Report are used otherwise than as provided or referred to in these conditions and the relevant User Guide.
- 7.8 Subject to the provisions of condition 7.3, GroundSure makes no representation, warranties, express or implied, as to the accuracy, reliability, completeness, validity or fitness for purpose of any Content and shall not be liable for any omission, error or inaccuracy in relation thereto unless GroundSure should reasonably have been alerted to any omission, error or inaccuracy in the Content.
- 7.9 Subject to the provisions of clause 7.1 notwithstanding anything to the contrary contained elsewhere in the Contract, and irrespective of whether multiple parties make use of the same Services, the total liability of GroundSure under or in connection with the Contract, whether in contract in tort for breach of statutory duty or otherwise shall not exceed £5 million per claim or series of connected claims.
- 7.10 Whilst GroundSure will use all reasonable endeavours to maintain operability of its internet ordering service it will not be liable for any loss or damages caused by a delay or loss of use of such service. The Client shall use GroundSure's internet ordering service at its own risk. GroundSure shall not be responsible for any damage to a Client or permitted assignee's computer, software, modem, telephone or other property resulting from the use of GroundSure's internet ordering service.
- 7.11 The Client accepts, and shall use all reasonable endeavours to procure that anyone who is provided with a copy of the Report accepts, that it has no claim or recourse to any Data Provider or to GroundSure in respect of the acts or omissions of such Data Providers including Content supplied by them save for where a Risk Screening Report comprises part of a Home Information Pack:
- (i) the Data Providers set out in the relevant User Guide shall be responsible for the quality and accuracy of the data supplied by them; and
 - (ii) where GroundSure makes an assessment of a Site to determine if it is likely to fall within Part II(A) of the Environmental Protection Act 1990, GroundSure shall be responsible for the interpretation of any Content provided by a Data Provider subject to the limitations set out in these terms and conditions.
- 7.12 GroundSure shall provide the Services using reasonable skill and care, however, GroundSure shall not be liable for any inaccurate statement or risk rating in a Report which resulted from a reasonable interpretation of the Content.
- 7.13 Subject to the provisions of clause 7.1, GroundSure shall not be liable for any losses (whether direct or indirect) and including (but not limited to) loss of profit caused by the suspension or reduction of activity on a Site, business interruption, all third party off-Site claims or any loss in value of a Site, loss of goodwill, loss of business opportunity or other similar losses alleged to be sustained by the Client, the Beneficiary or any third party.
- 7.14 GroundSure undertakes for the duration of the liability periods referred to in conditions 7.4 and 7.5 to maintain professional indemnity insurance in respect of its liabilities in respect of the Contract for £5 million in the aggregate which amount shall first include the whole of any sum payable for death or personal injury provided such insurance is readily available at commercially viable rates or for a lesser amount to be agreed with the Client should the cost of such insurance become commercially unviable. GroundSure shall produce evidence of such insurance if requested by the Client. A greater level of cover may be available upon request and agreement with the Client.

8 GroundSure right to suspend or terminate

- 8.1 In the event that GroundSure reasonably believes that the Client or Beneficiary as applicable has not provided the information or assistance required to enable the proper performance of the Services, GroundSure shall be entitled on fourteen days written notice to suspend all further performance of the Services until such time as any such deficiency has been made good.
- 8.2 GroundSure may additionally terminate the Contract immediately on written notice in the event that:
- (i) the Client shall fail to pay any sum due to GroundSure within 28 days of the due date for payment; or
 - (ii) the Client (being an individual) has a bankruptcy order made against him or (being a company) shall enter into liquidation whether compulsory or voluntary or have an Administration Order made against it or if a Receiver shall be appointed over the whole or any part of its property assets or undertaking or if the Client is struck off the Register of Companies or dissolved; or
 - (iii) the Client being a company is unable to pay its debts within the meaning of Section 123 of the Insolvency Act 1986 or being an individual appears unable to pay his debts within the meaning of Section 268 of the Insolvency Act 1986 or if the Client shall enter into a composition or arrangement with the Client's creditors or shall suffer distress or execution to be levied on his goods; or
 - (iv) the Client breaches any material term of the Contract (including, but not limited to, the obligations in condition 4) incapable of remedy or if remediable, is not remedied within 14 days of notice of the breach.

9. Client's Right to Terminate and Suspend

- 9.1 Subject to condition 10.2, the Client may at any time after commencement of the Services by notice in writing to GroundSure require GroundSure to terminate or suspend immediately performance of all or any of the Services.
- 9.2 The Client waives all and any right of cancellation it may have under the Consumer Protection (Distance Selling) Regulations 2000 (as amended) in respect of the Order of a Report/Mapping. This does not affect the Beneficiary's statutory rights.

10 Consequences of Withdrawal, Termination or Suspension

- 10.1 Upon termination or any suspension of the Services, GroundSure shall take steps to bring to an end the Services in an orderly manner, vacate any Site with all reasonable speed and shall deliver to the Client/Beneficiary any property of the Client/ Beneficiary in GroundSure's possession or control.
- 10.2 In the event of termination/suspension of the Contract under conditions 8 or 9, the Client shall pay to GroundSure all and any fees payable in respect of the performance of the Services up to the date of termination/suspension. In respect of any Consultancy Services provided, the Client shall also pay GroundSure any additional costs incurred in relation to the termination/suspension of the Contract.

11 General

- 11.1 The mapping contained in the Services is protected by Crown copyright and must not be used for any purpose outside the context of the Services or as specifically provided in these terms.
- 11.2 GroundSure reserves the right to amend these terms and conditions. No variation to these terms shall be valid unless signed by an authorised representative of GroundSure.
- 11.3 No failure on the part of GroundSure to exercise and no delay in exercising, any right, power or provision under these terms and conditions shall operate as a waiver thereof.
- 11.4 Save as expressly provided in conditions 4.2, 4.3, 6.3 and 11.5, no person other than the persons set out therein shall have any right under the Contract (Rights of Third Parties) Act 1999 to enforce any terms of the Contract.
- 11.5 The Secretary of State for Communities and Local Government acting through Ordnance Survey, may enforce breach of conditions 6.1 or 11.1 of these terms and conditions against the Client in accordance with the provisions of the Contracts (Rights of Third Parties) Act 1999.
- 11.6 GroundSure shall not be liable to the Client if the provision of the Services is delayed or prevented by one or more of the following circumstances:
- (i) the Client or Beneficiary's failure to provide facilities, access or information;
 - (ii) fire, storm, flood, tempest or epidemic;
 - (iii) Acts of God or the public enemy;
 - (iv) riot, civil commotion or war;
 - (v) strikes, labour disputes or industrial action;
 - (vi) acts or regulations of any governmental or other agency;
 - (vii) suspension or delay of services at public registries by Data Providers; or
 - (viii) changes in law.
- 11.7 Any notice provided shall be in writing and shall be deemed to be properly given if delivered by hand or sent by first class post, facsimile or by email to the address, facsimile number or email address of the relevant party as may have been notified by each party to the other for such purpose or in the absence of such notification the last known address.
- 11.8 Such notice shall be deemed to have been received on the day of delivery if delivered by hand, facsimile or email and on the second working day after the day of posting if sent by first class post.
- 11.9 The Contract constitutes the entire contract between the parties and shall supersede all previous arrangements between the parties.
- 11.10 Each of the provisions of the Contract is severable and distinct from the others and if one or more provisions is or should become invalid, illegal or unenforceable, the validity and enforceability of the remaining provisions shall not in any way be tainted or impaired.
- 11.11 These terms and conditions shall be governed by and construed in accordance with English law and any proceedings arising out of or connected with these terms and conditions shall be subject to the exclusive jurisdiction of the English courts.
- 11.12 If the Client or Beneficiary has a complaint about the Services, notice should be given in writing to the Compliance Officer at GroundSure who will respond in a timely manner.

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Report Reference: CMAPS-844237
Client Reference: Henthorn Road
Report Date: Jun 2, 2010
Report Delivery Method: **Email - pdf**
Client Email: andy@centremaps.com

GroundSure FloodInsight

Address: Henthorn Road, Clitheroe

Dear Sir/Madam,

Thank you for placing your order with CENTREMAPS. Please find enclosed the GroundSure FloodInsight report as requested.

If you need any further assistance, please do not hesitate to contact our helpline on 01886 832972 quoting the above CENTREMAPS reference number.

Yours faithfully,

CENTREMAPS

Enc.
GroundSure FloodInsight

GroundSure FloodInsight

Address: Henthorn Road, Clitheroe

Date: Jun 2, 2010

Client Reference: Henthorn Road

Client: CENTREMAPS



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Report Reference: CMAPS-844237

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Aerial Photograph of Study Site



Aerial photography supplied by Getmapping PLC.
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Site Name: Henthorn Road, Clitheroe

Grid Reference: 372944,440980

Size of Site: 16.35 ha

Report Reference: [CMAPS-844237](#)

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Page 2

Overview of Findings

For further details on each dataset, please refer to each individual section in the main report as listed.

Report Section

1. Environment Agency Flood Zones

1.1 Are there any Environment Agency indicative Zone 2 floodplains within 250m of the study site?	Yes
1.2 Are there any Environment Agency indicative Zone 3 floodplains within 250m of the study site?	Yes
1.3 Are there any Flood Defences within 250m of the study site?	No
1.4 Are there any areas benefiting from Flood Defences within 250m of the study site?	No
1.5 Are there any areas used for Flood Storage within 250m of the study site?	No

2. National Flood Risk Assessment (NaFRA)

2.1 What is the National Flood Risk Assessment (NaFRA) Flood Rating for the study site?	Significant
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3. Historic Flood Events

3.1 Has the site been subject to past flooding as recorded by the Environment Agency?	No
---	----

4. Surface Water Floods

4.1 Is the site or any area within 50m at risk of Surface Water (Pluvial) Flooding?	Yes
---	-----

5. Groundwater Flooding

5.1 What is the maximum BGS Groundwater Flooding susceptibility within 50m of the study site?	High
5.2 What is the BGS confidence rating for the Groundwater Flooding susceptibility areas?	Moderate

6. BGS Geological Indicators of historic flooding

6.1 Are there any geological indicators of historic flooding within 250m of the study site?	Yes
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7. JBA Reservoir failure

7. Is the property located in an area identified as being at potential risk in the event of a reservoir failure?	No
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Additional Matters

Riparian ownership	If your land abuts a river, stream or ditch, you may have responsibility to maintain this watercourse, even if Title Deeds show the property boundary to be adjacent to the watercourse. This includes the responsibility for clearing debris and obstructions which may impede the free passage of water and fish, and also includes the responsibilities to accept flood flows through your land, even if these are caused by inadequate capacity downstream. There is no duty in common law for a landowner to improve the drainage capacity of a watercourse. Please contact GroundSure if you need further advice on riparian ownership issues relating to this property.
Sewerage Flooding	Extreme rainfall events may overwhelm sewerage systems and cause local flooding. The water and sewerage companies within the UK are required to maintain 'DG5 – At Risk Registers' which record properties that have flooded from sewers and/or are considered to be at risk of flooding from sewers in the future. If your property is on the 'At Risk' Register, this may be recorded within a standard CON29 Drainage and Water search.

Using this Report

The following report is designed by Environmental Consultants for Environmental Professionals bringing together the most up-to-date market leading environmental data. This report is provided under and subject to the Terms & Conditions agreed between GroundSure and the Client.

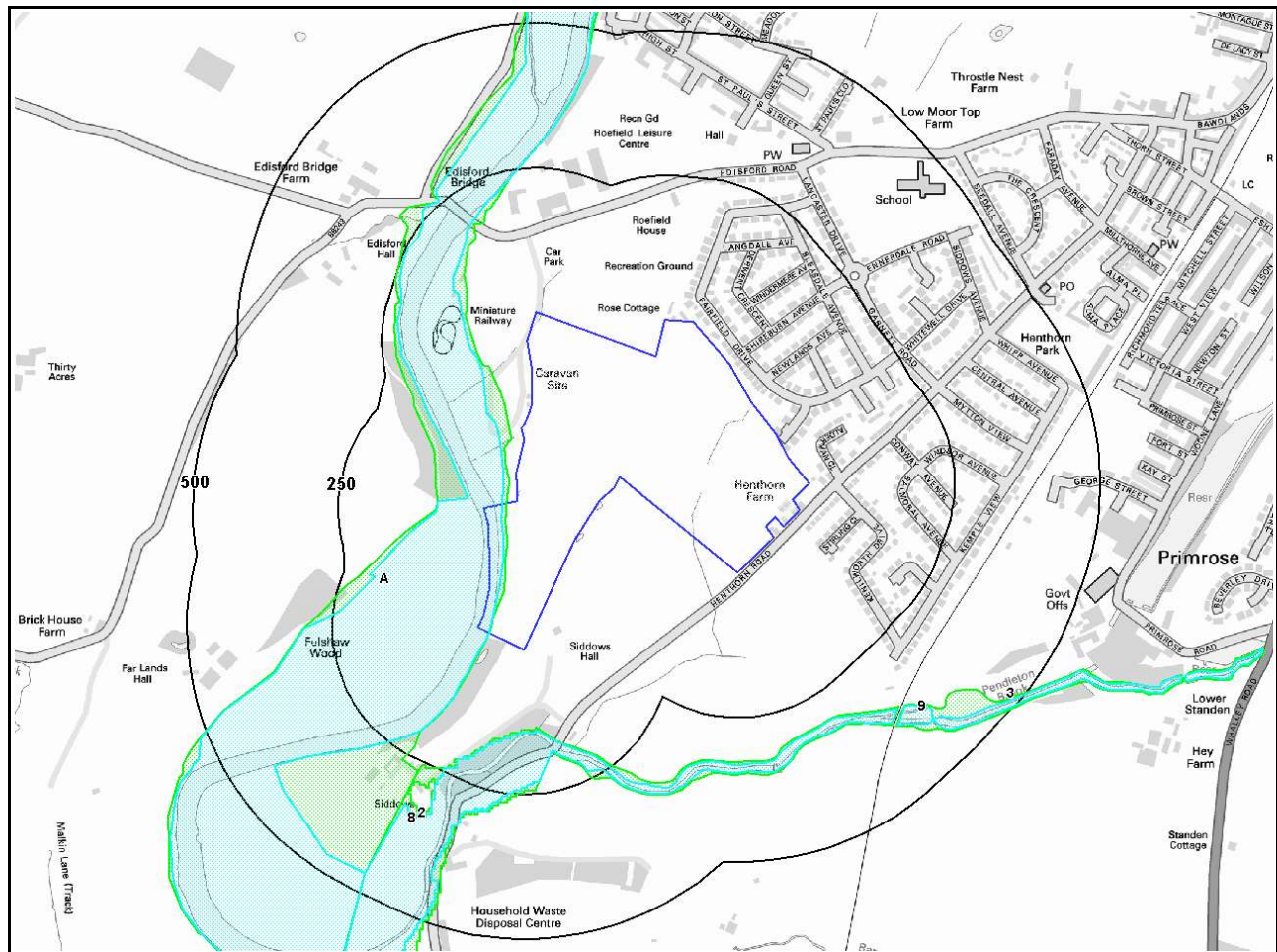
Note: Maps

Only certain features are placed on the maps within the report. All features represented on maps found within this search are given an identification number. This number identifies the feature on the mapping and correlates it to the additional information provided below. This identification number precedes all other information and takes the following format -Id: 1, Id: 2, etc. Where numerous features on the same map are in such close proximity that the numbers would obscure each other a letter identifier is used instead to represent the features. (e.g. Three features which overlap may be given the identifier "A" on the map and would be identified separately as features 1A, 3A, 10A on the data tables provided).

Where a feature is reported in the data tables to a distance greater than the map area, it is noted in the data table as "Not Shown".

All distances given in this report are in Metres (m). Directions are given as compass headings such as N: North, E: East, NE: North East from the nearest point of the study site boundary.

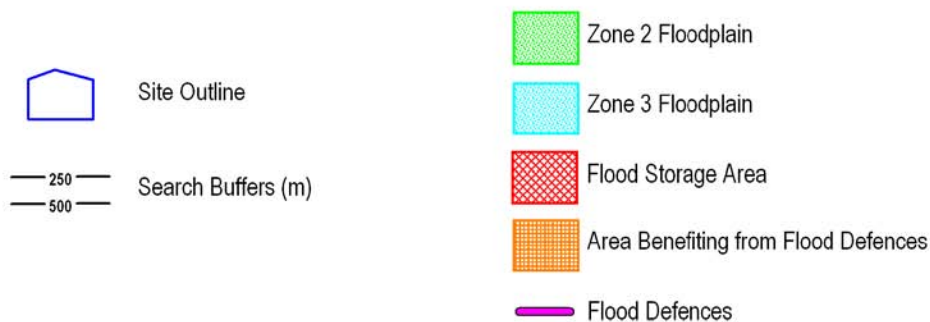
1. River and Coastal Flood Map



River and Coastal Flood Legend



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1. Environment Agency Flood Zones

1.1 River and Coastal Zone 2 Flooding

Is the site within 250m of an Environment Agency indicative Zone 2 floodplain? **Yes**

Zone 2 floodplain estimates the annual probability of flooding as one in one thousand (0.1%) or greater from rivers and the sea but less than 1% from rivers or 0.5% from the sea. Alternatively, where information is available they may show the highest known flood level. Any relevant data is represented on Map 1 – River and Coastal Flooding:

The following floodplain records are represented as green shading on the Flood Map (1):

ID	Distance [m]	Direction	Update	Type
1A	0.0	On Site	18-Mar-2010	Zone 2 - (Fluvial)
2	135.0	S	18-Mar-2010	Zone 2 - (Fluvial)

1.2 River and Coastal Zone 3 Flooding

Is the site within 250m of an Environment Agency indicative Zone 3 floodplain? **Yes**

Zone 3 estimates the annual probability of flooding as one in one hundred (1%) or greater from rivers and a one in two hundred (0.5%) or greater from the sea. Alternatively, where information is available they may show the highest known flood level. Any relevant data is represented on Map 1 – River and Coastal Flooding.

The following floodplain records are represented as green shading on the Flood Map (1):

ID	Distance [m]	Direction	Update	Type
7A	0.0	On Site	18-Mar-2010	Zone 3 - (Fluvial)
8	140.0	S	18-Mar-2010	Zone 3 - (Fluvial)

1.3 River and Coastal Flood Defences

Are there any Flood Defences within 250m of the study site ? **No**

Only flood defences constructed within the last five years to Environment Agency standards are likely to be shown within this dataset. Any relevant data is represented on Map 1 – River and Coastal Flooding.

1.4 Areas benefiting from Flood Defences

Are there any areas benefiting from Flood Defences within 250m of the study site? **No**

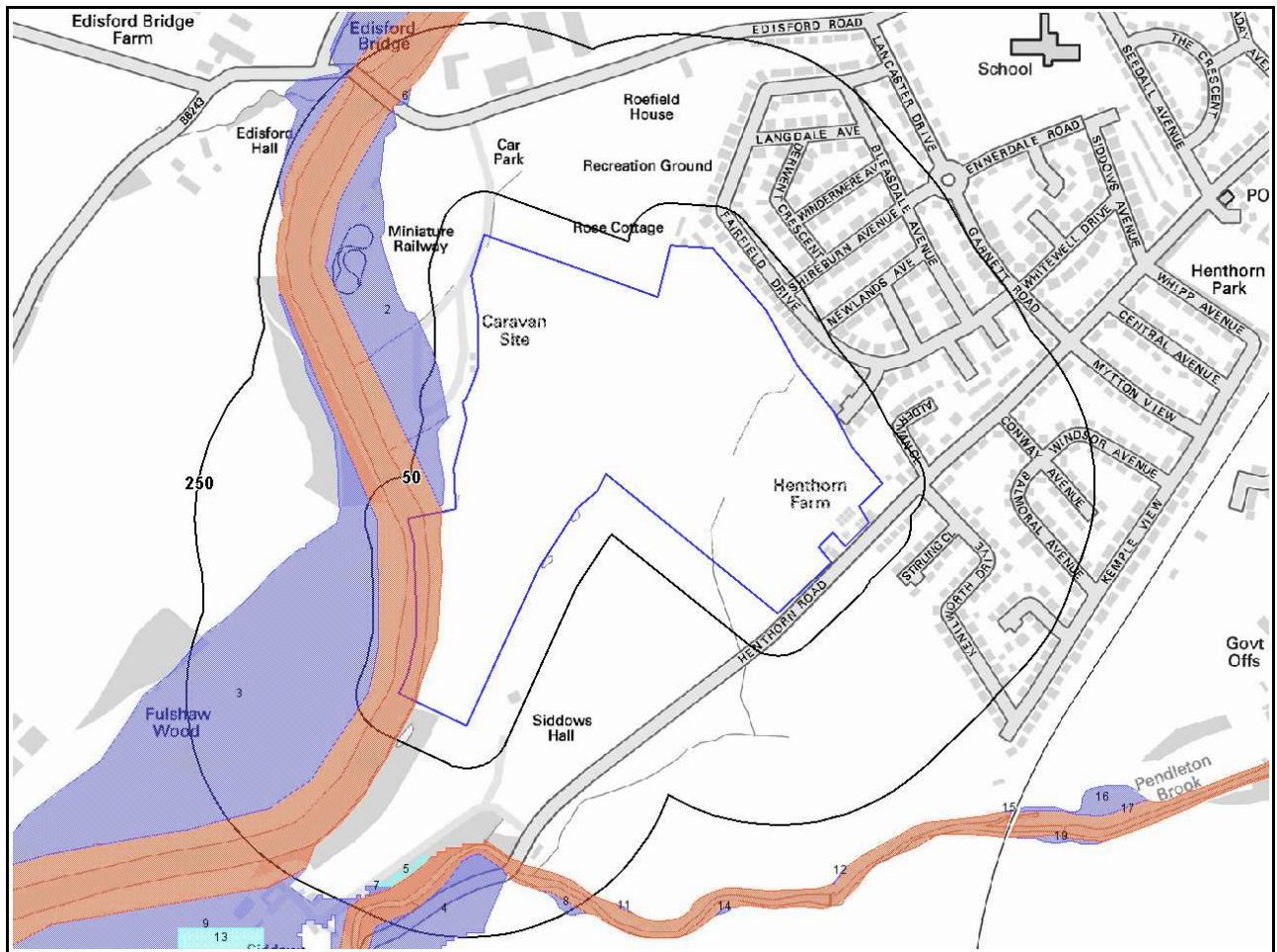
Any relevant data is represented on Map 1 – River and Coastal Flooding.

1.5 Areas used for Flood Storage

Are there any areas used for Flood Storage within 250m of the study site? **No**

Flood Storage Areas are considered part of the functional floodplain, and are areas where water has to flow or be stored in times of flood. *Planning Policy Statement (PPS) 25: Development and Flood Risk* states that only water-compatible development and essential infrastructure should be permitted within flood storage areas, and existing development within this area should be relocated to an area with a lower risk of flooding. Any relevant data is represented on Map 1 – River and Coastal Flooding.

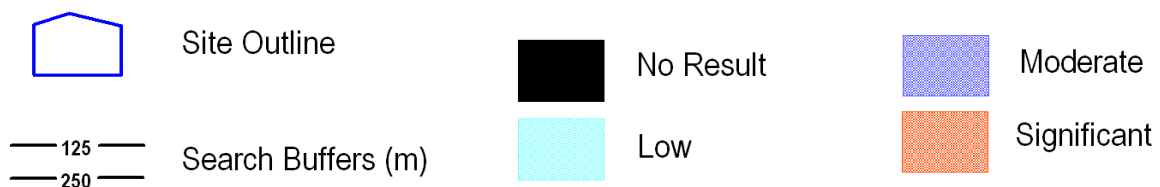
2. NaFRA 2008 Flooding Map



NaFRA 2008 Flood Legend



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2.1 National Flood Risk Assessment (NaFRA 2008) Flood Rating (River and Coastal)

What is the highest risk of flooding onsite?

Significant

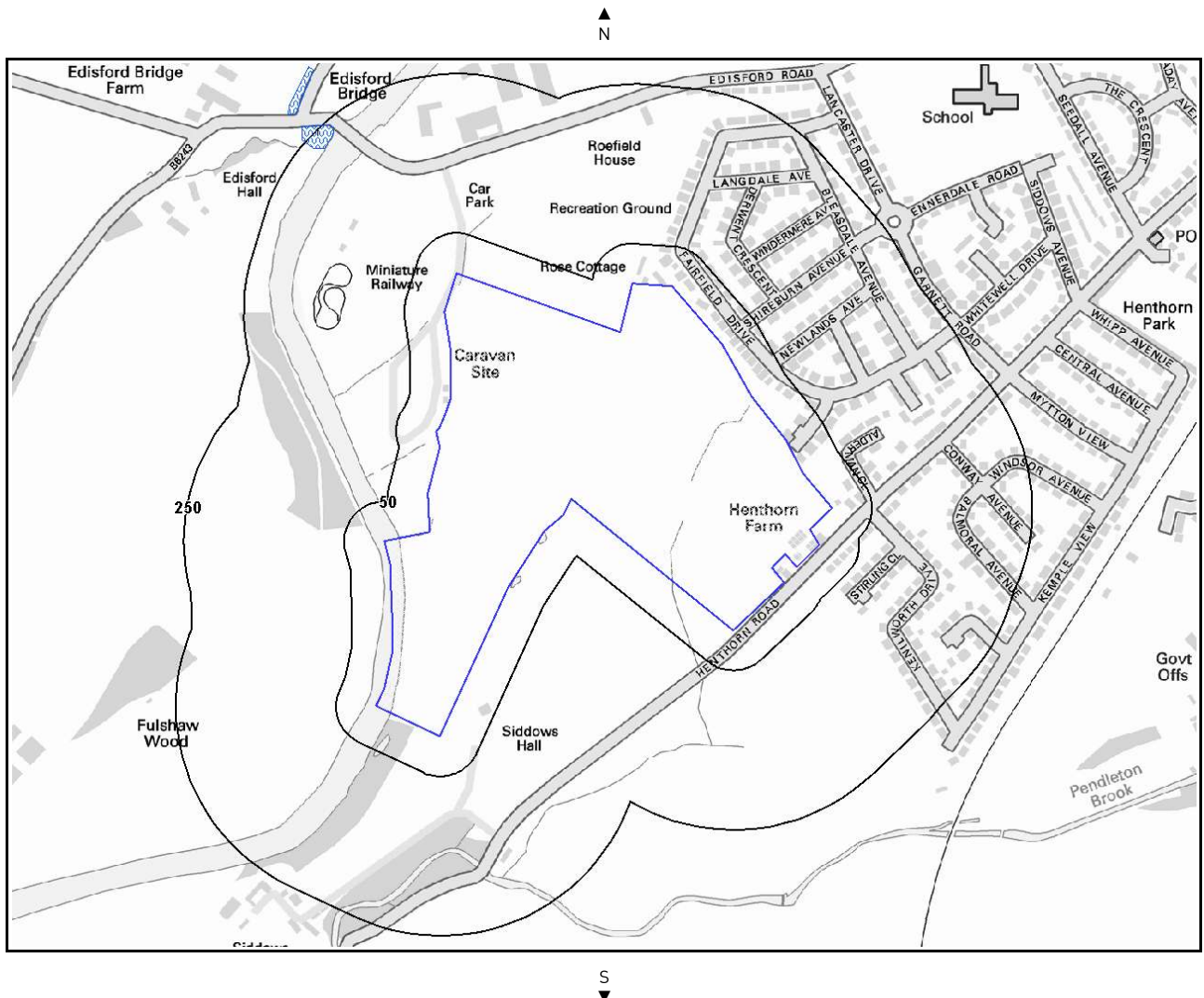
The Environment Agency NaFRA database provides an indication of flood river and coastal risk at a national level on a 50m grid with the flood rating at the centre of the grid calculated and given above. The data considers the probability that the flood defences will overtop or breach, and the distance from the river or the sea.

Most insurance companies providing cover for flood risk use this data as the basis of their risk model, although they may also utilise additional information such as claims histories, which may further influence their decision. Where a significant risk of flooding is identified flood risk insurance may be difficult to obtain without further work being undertaken. Property owners of sites within Low and Moderate risk areas are still considered to be at risk of flooding and insurance premiums may be increased as a result. Owners of properties within Low, Moderate and Significant risk areas, as well as areas yet to receive a full assessment are advised to sign up to the Environment Agency's Floodline Warning scheme.

Any relevant data within 250m is represented on the NaFRA Flood map. Data to 50m is reported in the table below.

ID	Distance [m]	Direction	NaFRA flood Risk
1	0.0	On Site	Significant
2	7.0	N	Moderate
3	35.0	W	Moderate

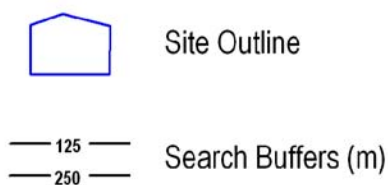
3. Historic Flooding Events



Historic Flooding Legend



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3.1 Historic Flood Outlines

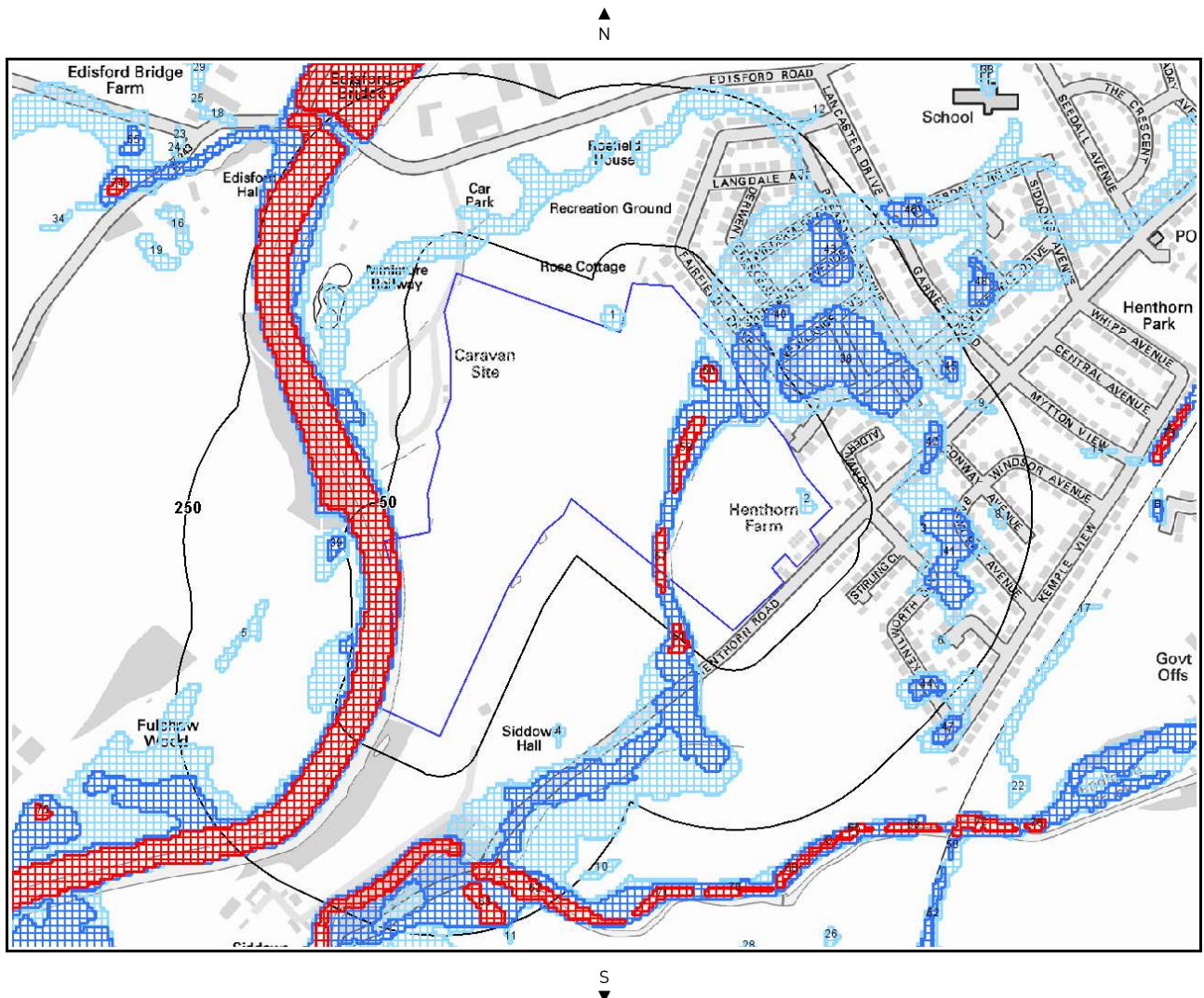
Has the site or any area within 250m been subject to historic flooding as recorded by the Environment Agency? **Yes**

This database shows the individual footprint of every flood event recorded by the Environment Agency and previous bodies. This data is used to understand where flooding has occurred in the past and provides details as available. Absence of a historic flood event for an area does not mean that the area has never flooded, but only that the Environment Agency do not currently have records of flooding within the area. Equally, a record of a flood footprint in previous years does not mean that an area will flood again, and this information does not take account of flood management schemes and improved flood defences.

Any records found within the search radius are displayed on Map 3 – Historic Flooding Events.

ID	Distance [m]	Direction	Event Name	Date of flood	Flood Source	Flood Cause	Type of Flood	Environment Agency Comments
1	227.0	NW	RIBB	Start Date: 31-01-1995 End Date: 01-02-1995	main river	channel capacity exceeded (no raised defences)	Fluvial	19 houses were flooded (No. 65 - 83 Riverside), affected with between 1" - 3" of water in the ground floors.

4. JBA Surface Water (Pluvial) Flood Map



Enabled by  Ordnance Survey

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This data is provided by JBA Consulting, © Jeremy Benn Associates Limited 2008/2009

4.1 JBA Surface Water (Pluvial) Flood Risk

What is the maximum Surface Water (Pluvial) Flood risk at the study site as provided by JBA Consulting?

High

Surface Water (Pluvial) flooding is defined as flooding caused by rainfall-generated overland flow before the runoff enters a watercourse or sewer. In such events, sewerage and drainage systems and surface watercourses may be entirely overwhelmed. The map was produced by simulating a 1 in 200 year rainfall event over a 6.5 hour duration. JBA's 2D hydraulic modelling techniques were used to identify overland flow routes and areas where surface water will pond.

Surface Water (Pluvial) flooding will usually be a result of extreme rainfall events, though may also occur when lesser amounts of rain falls on land which has low permeability and/or is already saturated, frozen or developed. In such cases overland flow and 'ponding' in topographical depressions may occur. The data within this report is based upon a modelled 1 in 200 year rainfall event, and indicates the depths to which an area may expect to be flooded in such an event. Data relating to surface water (pluvial) flooding is represented on Map 4 – JBA Surface Water (Pluvial) Flood Map.

This data is provided by JBA Consulting, © Jeremy Benn Associates Limited 2008/2009

The following pluvial (surface water) flood risk records within 50m of the study site are shown below:

ID	Distance [m]	Direction	Risk	Depth of Flooding (m)
1	0.0	On Site	Low Susceptibility	Between 0.1 and 0.3m
2	0.0	On Site	Low Susceptibility	Between 0.1 and 0.3m
3	0.0	On Site	Low Susceptibility	Between 0.1 and 0.3m
37	0.0	On Site	Moderate Susceptibility	Between 0.3 and 1m
38	31.0	NE	Moderate Susceptibility	Between 0.3 and 1m
39	50.0	W	Moderate Susceptibility	Between 0.3 and 1m
57	0.0	On Site	Significant Susceptibility	Greater than 1m
58	0.0	On Site	Significant Susceptibility	Greater than 1m
59	0.0	On Site	Significant Susceptibility	Greater than 1m
60	0.0	On Site	Significant Susceptibility	Greater than 1m
61	35.0	SW	Significant Susceptibility	Greater than 1m

5. Groundwater flooding

5.1 Groundwater Flooding Susceptibility Areas

Are there any British Geological Survey groundwater flooding susceptibility flood areas within 50m of the boundary of the study site?

Yes

What is the highest susceptibility to groundwater flooding in the search area based on the underlying geological conditions?

High

Where high groundwater flooding susceptibility is indicated, this means that given the geological conditions in the area groundwater flooding hazard should be considered in all land-use planning decisions. It is recommended that other relevant information e.g. records of previous incidence of groundwater flooding, rainfall, property type, and land drainage information be investigated in order to establish relative, but not absolute, risk of groundwater flooding.

5.2 Groundwater Flooding Confidence Areas

What is the British Geological Survey confidence rating in this result?

Moderate

Groundwater flooding is defined as the emergence of groundwater at the ground surface or the rising of groundwater into man-made ground under conditions where the normal range of groundwater levels is exceeded.

The **confidence rating** is on a fivefold scale - Low, Moderately Low, Moderate, Moderately High and High. This provides a relative indication of the BGS confidence in the accuracy of the susceptibility result for groundwater flooding. This is based on the amount and precision of the information used in the assessment. In areas with a relatively lower level of confidence the susceptibility result should be treated with more caution. In other areas with higher levels of confidence the susceptibility result can be used with more confidence.

6. BGS Geological Indicators of Flooding

Are there any geological indicators of flooding within 250m of the study site?

Yes

This dataset identifies the presence of superficial geological deposits which indicate that the site may be, or have been in the past, vulnerable to inland and/or coastal flooding. This assessment does not take account of any man-made factors such as flood protection schemes, and the data behind the report are purely geological.

Distance [m]	Direction	Description
0.0	On Site	Deposits susceptible to inland fluvial/pluvial flooding

7. JBA Reservoir Failure Impact Modelling

Is the property located in an area identified as being at potential risk in the event of a reservoir failure?

No

JBA consulting have modelled the flooding impact from 1,700 reservoirs in England and Wales, should there be a catastrophic failure of a reservoir wall or embankment.

Guidance: None required

8. Contacts

CENTREMAPS

Telephone: 01886 832972

groundsure@centremaps.co.uk

CENTREMAPS, Brockamin House, Leigh, Worcester, London, WR6 5JU

Directors: M C Walker, MInst C.E.S., C M Walker,
S J Hawkins BSc (Hons), S E Stewart BSc (Hons)
Registered No. 1890261 Registered in England and Wales
Registered Company: Laser Surveys Limited
Brockamin House, Leigh, Worcester, WR6 5JU.

British Geological Survey (England & Wales)

Kingsley Dunham Centre

Keyworth, Nottingham NG12 5GG

Tel: 0115 936 3143. Fax: 0115 936 3276. Email:

enquiries@bgs.ac.uk

Web: www.bgs.ac.uk

BGS Geological Hazards Reports and general geological enquiries

centremapslive.com
the mapping portal from Laser Surveys



**British
Geological Survey**

NATURAL ENVIRONMENT RESEARCH COUNCIL

Environment Agency

Floodline tel: 0845 988 1188

General enquiry tel: 08708 506 506

Web: www.environment-agency.gov.uk

Email: enquiries@environment-agency.gov.uk



**Environment
Agency**

JBA Consulting

South Barn,
Broughton Hall,
Skipton
BD23 3AE
01756 799919



Ordnance Survey

Romsey Road
Southampton SO16 4GU

Tel: 08456 050505



Local Authority

Authority: Ribble Valley Borough Council

Phone: 01200 425111

Web: www.ribblevalley.gov.uk

Address: Council Offices, Church Walk, Clitheroe,
Lancashire, BB7 2RA

Get Mapping PLC

Virginia Villas, High Street, Hartley Witney, Hampshire RG27 8NW

Tel: 01252 845444



Acknowledgements

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This report has been prepared in accordance with the GroundSure Ltd standard Terms and Conditions of business for work of this nature.

Standard Terms and Conditions

1 Definitions

In these conditions unless the context otherwise requires:

"Beneficiary" means the Client or the customer of the Client for whom the Client has procured the Services.

"Commission" means an order for Consultancy Services submitted by a Client.

"Consultancy Services" mean consultancy services provided by GroundSure including, without limitation, carrying out interpretation of third party and in-house environmental data, provision of environmental consultancy advice, undertaking environmental audits and assessments, Site investigation, Site monitoring and related items.

"Content" means any data, database or other information contained in a Report or Mapping which is provided to GroundSure by a Data Provider.

"Contract" means the contract between GroundSure and the Client for the performance of the Services which arises upon GroundSure's acceptance of an Order or Commission and which shall incorporate these conditions, the relevant GroundSure User Guide, proposal by GroundSure and the content of any subsequent report, and any agreed amendments in accordance with condition 11.

"Client" means the party that submits an Order or Commission.

"Data Provider" means any third party providing Content to GroundSure.

"Data Report" means reports comprising factual data with no professional interpretation in respect of the level of likely risk and/or liability available from GroundSure.

"GroundSure" means GroundSure Limited, a company registered in England and Wales under number 03421028 and whose registered office is at Greater London House, Hampstead Road, London NW1 7EJ.

"Home Information Pack" means a combination of reports required when selling a residential property.

"Intellectual Property" means any patent, copyright, design rights, service marks, moral rights, data protection rights, know-how, trade mark or any other intellectual property rights.

"Mapping" an historical map or a combination of historical maps of various ages, time periods and scales available from GroundSure.

"Order" means an order form submitted by the Client requiring Services from GroundSure in respect of a specified Site.

"Order Website" means online platform via which Orders may be placed.

"Report" means a Risk Screening Report or Data Report for commercial or residential property available from GroundSure relating to the Site prepared in accordance with the specifications set out in the relevant User Guide.

"Risk Screening Report" means one of GroundSure's risk screening reports such as GroundSure Homebuyers, GroundSure Home Environmental GroundSure SiteGuard, GroundSure Screening, GroundSure Review, GroundSure Developer Review, or any other risk screening report available from GroundSure.

"Services" means the provision of any Report, Mapping or Consultancy Services which GroundSure has agreed to carry out for the Client/Beneficiary on these terms and conditions in respect of the Site.

"Site" means the landsite in respect of which GroundSure provides the Services.

"User Guide" means the relevant current version of the user guide, available upon request from GroundSure.

2 Scope of Services

2.1 GroundSure agrees to carry out the Services in accordance with the Contract and to the extent set out therein.

2.2 GroundSure shall exercise all the reasonable skill, care and diligence to be expected of experienced environmental consultants in the performance of the Services.

2.3 The Client acknowledges that it has not relied on any statement or representation made by or on behalf of GroundSure which is not set out and expressly agreed in the Contract.

2.4 Terms and conditions appearing on a Client's order form, printed stationery or other communication, including invoices, to GroundSure, its employees, servants, agents or other representatives or any terms implied by custom, practice or course of dealing shall be of no effect and these terms and conditions shall prevail over all others.

2.5 In the event that a Client/Beneficiary opts to take out insurance in conjunction with or as a result of the Services, such insurance shall be subject solely to the terms of any policy issued to it in that respect and GroundSure will have no liability therefore.

2.6 GroundSure's quotations/proposals are valid for a period of 30 days only. GroundSure reserves the right to withdraw any quotation at any time before GroundSure accepts an Order or Commission. GroundSure's acceptance of an Order or Commission shall be effective only where such acceptance is in writing and signed by GroundSure's authorised representative or where accepted via GroundSure's Order Website.

3 The Client's obligations

3.1 The Client shall be solely responsible for ensuring that the Report/Mapping ordered is appropriate and suitable for the Beneficiary's needs.

3.2 The Client shall (or shall procure that the Beneficiary shall) supply to GroundSure as soon as practicable and without charge all information necessary and accurate relevant data including any specific and/or unusual environmental information relating to the Site known to the Client/Beneficiary which may pertain to the Services and shall give such assistance as GroundSure shall reasonably require in the performance of the Services (including, without limitation, access to a Site, facilities and equipment as agreed in the Contract).

3.3 Where Client/Beneficiary approval or decision is required, such approval or decision shall be given or procured in reasonable time as not to delay or disrupt the performance of any other part of the Services.

3.4 The Client shall not and shall not knowingly permit the Beneficiary to, save as expressly permitted by these terms and conditions, re-sell, alter, add to, amend or use out of context the content of any Report, Mapping or, in respect of any Services, information given by GroundSure. For the avoidance of doubt, the Client and Beneficiary may make the Report, Mapping or GroundSure's findings available to a third party, but such third party cannot rely on the same unless expressly permitted under condition 4.

3.5 The Client is responsible for maintaining the confidentiality of its user name and password if using GroundSure's internet ordering service and accepts responsibility for all activity that occurs under such account and password.

4 Reliance

4.1 Upon full payment of all relevant fees and subject to the provisions of these terms and conditions, the Client and Beneficiary are granted an irrevocable royalty-free licence to use the information contained in the Report, Mapping or in a report prepared by GroundSure in respect of or arising out of the Consultancy Services. The Services may only be used for the benefit of the Client and those persons listed in conditions 4.2 and 4.3.

4.2 In relation to Data Reports, Mapping and Risk Screening Reports, the Client shall be entitled to make Reports available to (i) the Beneficiary, (ii) the Beneficiary's professional advisers, (iii) any person providing funding to the Beneficiary in relation to the Site (whether directly or as part of a lending syndicate), (iv) the first purchaser or first tenant of the Site (v) the professional advisers and lenders of the first purchaser or tenant of the Site. For the avoidance of doubt, such persons shall include any entity necessary under the Housing Act 2004 (as amended). Accordingly GroundSure shall have the same duties and obligations to those persons in respect of the Services as it has to the Client and those persons shall have the benefit of any of the Client's rights under the Contract as if those persons were parties to the Contract. For the avoidance of doubt, the limitations of GroundSure's liability as set out in condition 7 shall apply.

4.3 In relation to Consultancy Services, reliance shall be limited to the Client, Beneficiary and named parties on the Report.

4.4 Save as set out in conditions 4.2 and 4.3 and unless otherwise agreed in writing with GroundSure, any other party considering the information supplied by GroundSure as part of the Services, including (but not limited to) insurance underwriters, does so at their own risk and GroundSure has no legal obligations to such party unless otherwise agreed in writing.

4.5 The Client shall not and shall not knowingly permit any person (including the Beneficiary) who is provided with a copy of any Report shall not except as permitted herein or by separate agreement with GroundSure: (a) remove, suppress or modify any trade mark, copyright or other proprietary marking from the Report or Mapping; (b) create any product which is derived directly or indirectly from the data contained in the Report or Mapping; (c) combine the Report or Mapping with, or incorporate the Report or Mapping into any other information data or service; or (d) re-format or otherwise change (whether by modification, addition or enhancement) data or images contained in the Report or Mapping.

4.6 Notwithstanding condition 4.5, if the Client acts in a professional capacity, it may make reasonable use of a Report and/or findings made as a result of Consultancy Services to advise Beneficiaries. However, GroundSure shall have no liability in respect of any opinion or report given to such Beneficiaries by the Client or a third party.

5 Fees and Disbursements

5.1 GroundSure shall charge the Client fees at the rate and frequency specified in the Contract together, in the case of Consultancy Services, with all proper disbursements incurred by GroundSure in performing the Services. For the avoidance of doubt, the fees payable for the Services are as set out in GroundSure's written proposal, Order Website or Order acknowledgement form. The Client shall in addition pay all value added tax or other tax payable on such fees and disbursements in relation to the provision of the Services.

5.2 Unless GroundSure requires prepayment, the Client shall promptly pay all fees disbursements and other monies due to GroundSure in full without deduction, counterclaim or set off together with such value added tax or other tax as may be required within 30 days from the date of GroundSure's invoice or such other period as may be agreed in writing between GroundSure and the Client ("Payment Date"). GroundSure reserves the right to charge interest which shall accrue on a daily basis from 30 days after the date of Payment Date until the date of payment (whether before or after judgement) at the rate of five per cent per annum above the Bank of England base rate from time to time.

5.3 In the event that the Client disputes the amount payable in respect of GroundSure's invoice it shall notify GroundSure no later than 28 days after the date thereof that it is in dispute. In default of such notification the Client shall be deemed to have agreed the amount thereof. As soon as reasonably practicable following receipt of a notification in respect of any disputed invoice, a member of the management team at GroundSure shall contact the Client and the parties shall use all reasonable endeavours to resolve the dispute.

6 Intellectual Property

6.1 Subject to the provisions of condition 4.1, the Client and the Beneficiary hereby acknowledge that all Intellectual Property in the Services are and shall remain owned by either GroundSure or the Data Providers and nothing in these terms purports to transfer or assign any rights to the Client or the Beneficiary in respect of the Intellectual Property.

6.2 The Client shall acknowledge the ownership of the Content where such Content is incorporated or used in the Client's own documents, reports, systems or services whether or not these are supplied to a third party.

6.3 Data Providers may enforce any breach of condition 6.1 against the Client or Beneficiary.

7 Liability

Report Reference: **CMAPS-844237**

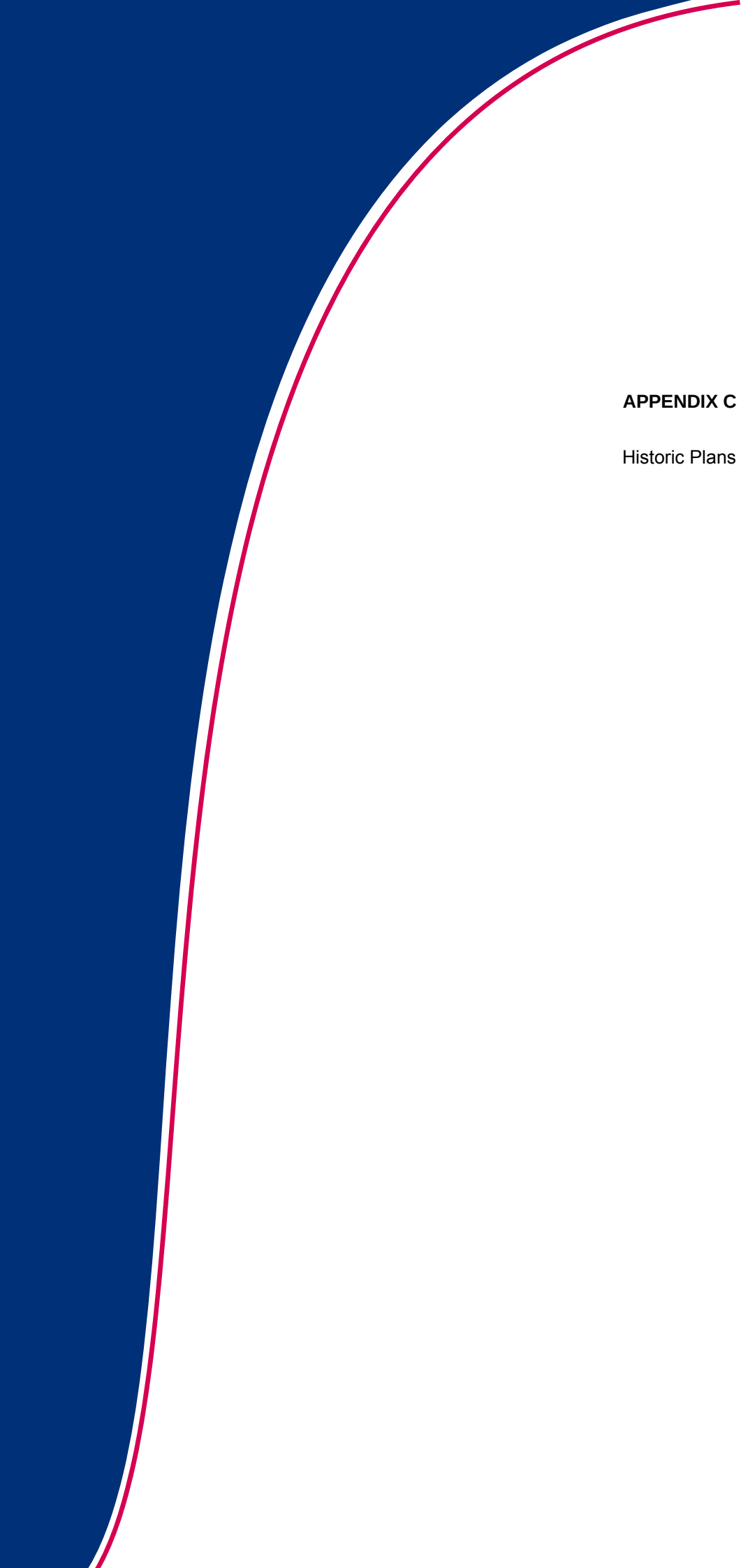
Brought to you by **CENTREMAPS**

If you would like any further assistance regarding this report then please contact

CENTREMAPS on (T) 01886 832972, (F) 01883 833485, email: groundsurre@centremaps.co.uk

- 7.1 Nothing in these terms and conditions shall limit GroundSure's liability for causing death or personal injury through negligence or wilful default.
- 7.2 Save as otherwise set out in these conditions, any information provided by one party ("Disclosing party") to the other party ("Receiving Party") shall be treated as confidential except so far as authorised by the Disclosing Party to provide such information in whole or in part to a third party.
- 7.3 Nothing in these conditions shall affect the statutory rights of a consumer under the applicable consumer protection legislation from time to time.
- 7.4 In relation to Data Reports, Mapping and Risk Screening Reports, GroundSure's liability under the Contract shall cease upon the expiry of six years from the date when the Beneficiary became aware that it may have a claim against GroundSure in respect of the Services provided always that there shall be no liability at the expiration of twelve years from the completion of the Contract. For the avoidance of doubt, any claims in respect of which proceedings are notified to GroundSure in writing prior to the expiry of the time periods referred to in this clause shall survive the expiry of those time periods provided any such claim is actually commenced within six months of notification.
- 7.5 In relation to Consultancy Services GroundSure's liability under the Contract shall cease upon the expiry of six years from the date the Services were completed.
- 7.6 GroundSure shall not be liable to the Client or any person to whom the Client provides a copy of a Data Report, Mapping or Risk Screening Report in any circumstances whatsoever unless arising out of a breach on its part of the obligations set out in the Contract.
- 7.7 GroundSure shall not be liable if the Data Reports, Mapping or Risk Screening Report are used otherwise than as provided or referred to in these conditions and the relevant User Guide.
- 7.8 Subject to the provisions of condition 7.3, GroundSure makes no representation, warranties, express or implied, as to the accuracy, reliability, completeness, validity or fitness for purpose of any Content and shall not be liable for any omission, error or inaccuracy in relation thereto unless GroundSure should reasonably have been alerted to any omission, error or inaccuracy in the Content.
- 7.9 Subject to the provisions of clause 7.1 notwithstanding anything to the contrary contained elsewhere in the Contract, and irrespective of whether multiple parties make use of the same Services, the total liability of GroundSure under or in connection with the Contract, whether in contract in tort for breach of statutory duty or otherwise shall not exceed £5 million per claim or series of connected claims.
- 7.10 Whilst GroundSure will use all reasonable endeavours to maintain operability of its internet ordering service it will not be liable for any loss or damages caused by a delay or loss of use of such service. The Client shall use GroundSure's internet ordering service at its own risk. GroundSure shall not be responsible for any damage to a Client or permitted assignee's computer, software, modem, telephone or other property resulting from the use of GroundSure's internet ordering service.
- 7.11 The Client accepts, and shall use all reasonable endeavours to procure that anyone who is provided with a copy of the Report accepts, that it has no claim or recourse to any Data Provider or to GroundSure in respect of the acts or omissions of such Data Providers including Content supplied by them save for where a Risk Screening Report comprises part of a Home Information Pack:
- (i) the Data Providers set out in the relevant User Guide shall be responsible for the quality and accuracy of the data supplied by them; and
 - (ii) where GroundSure makes an assessment of a Site to determine if it is likely to fall within Part II(A) of the Environmental Protection Act 1990, GroundSure shall be responsible for the interpretation of any Content provided by a Data Provider subject to the limitations set out in these terms and conditions.
- 7.12 GroundSure shall provide the Services using reasonable skill and care, however, GroundSure shall not be liable for any inaccurate statement or risk rating in a Report which resulted from a reasonable interpretation of the Content.
- 7.13 Subject to the provisions of clause 7.1, GroundSure shall not be liable for any losses (whether direct or indirect) and including (but not limited to) loss of profit caused by the suspension or reduction of activity on a Site, business interruption, all third party off-Site claims or any loss in value of a Site, loss of goodwill, loss of business opportunity or other similar losses alleged to be sustained by the Client, the Beneficiary or any third party.
- 7.14 GroundSure undertakes for the duration of the liability periods referred to in conditions 7.4 and 7.5 to maintain professional indemnity insurance in respect of its liabilities in respect of the Contract for £5 million in the aggregate which amount shall first include the whole of any sum payable for death or personal injury provided such insurance is readily available at commercially viable rates or for a lesser amount to be agreed with the Client should the cost of such insurance become commercially unviable. GroundSure shall produce evidence of such insurance if requested by the Client. A greater level of cover may be available upon request and agreement with the Client.
- 8 GroundSure right to suspend or terminate**
- 8.1 In the event that GroundSure reasonably believes that the Client or Beneficiary as applicable has not provided the information or assistance required to enable the proper performance of the Services, GroundSure shall be entitled on fourteen days written notice to suspend all further performance of the Services until such time as any such deficiency has been made good.
- 8.2 GroundSure may additionally terminate the Contract immediately on written notice in the event that:
- (i) the Client shall fail to pay any sum due to GroundSure within 28 days of the due date for payment; or
 - (ii) the Client (being an individual) has a bankruptcy order made against him or (being a company) shall enter into liquidation whether compulsory or voluntary or have an Administration Order made against it or if a Receiver shall be appointed over the whole or any part of its property assets or undertaking or if the Client is struck off the Register of Companies or dissolved; or
 - (iii) the Client being a company is unable to pay its debts within the meaning of Section 123 of the Insolvency Act 1986 or being an individual appears unable to pay his debts within the meaning of Section 268 of the Insolvency Act 1986 or if the Client shall enter into a composition or arrangement with the Client's creditors or shall suffer distress or execution to be levied on his goods; or
 - (iv) the Client breaches any material term of the Contract (including, but not limited to, the obligations in condition 4) incapable of remedy or if remediable, is not remedied within 14 days of notice of the breach.
- 9 Client's Right to Terminate and Suspend**
- 9.1 Subject to condition 10.2, the Client may at any time after commencement of the Services by notice in writing to GroundSure require GroundSure to terminate or suspend immediately performance of all or any of the Services.
- 9.2 The Client waives all and any right of cancellation it may have under the Consumer Protection (Distance Selling) Regulations 2000 (as amended) in respect of the Order of a Report/Mapping. This does not affect the Beneficiary's statutory rights.
- 10 Consequences of Withdrawal, Termination or Suspension**
- 10.1 Upon termination or any suspension of the Services, GroundSure shall take steps to bring to an end the Services in an orderly manner, vacate any Site with all reasonable speed and shall deliver to the Client/Beneficiary any property of the Client/ Beneficiary in GroundSure's possession or control.
- 10.2 In the event of termination/suspension of the Contract under conditions 8 or 9, the Client shall pay to GroundSure all and any fees payable in respect of the performance of the Services up to the date of termination/suspension. In respect of any Consultancy Services provided, the Client shall also pay GroundSure any additional costs incurred in relation to the termination/suspension of the Contract.
- 11 General**
- 11.1 The mapping contained in the Services is protected by Crown copyright and must not be used for any purpose outside the context of the Services or as specifically provided in these terms.
- 11.2 GroundSure reserves the right to amend these terms and conditions. No variation to these terms shall be valid unless signed by an authorised representative of GroundSure.
- 11.3 No failure on the part of GroundSure to exercise and no delay in exercising, any right, power or provision under these terms and conditions shall operate as a waiver thereof.
- 11.4 Save as expressly provided in conditions 4.2, 4.3, 6.3 and 11.5, no person other than the persons set out therein shall have any right under the Contract (Rights of Third Parties) Act 1999 to enforce any terms of the Contract.
- 11.5 The Secretary of State for Communities and Local Government acting through Ordnance Survey, may enforce breach of conditions 6.1 or 11.1 of these terms and conditions against the Client in accordance with the provisions of the Contracts (Rights of Third Parties) Act 1999.
- 11.6 GroundSure shall not be liable to the Client if the provision of the Services is delayed or prevented by one or more of the following circumstances:
- (i) the Client or Beneficiary's failure to provide facilities, access or information;
 - (ii) fire, storm, flood, tempest or epidemic;
 - (iii) Acts of God or the public enemy;
 - (iv) riot, civil commotion or war;
 - (v) strikes, labour disputes or industrial action;
 - (vi) acts or regulations of any governmental or other agency;
 - (vii) suspension or delay of services at public registries by Data Providers; or
 - (viii) changes in law.
- 11.7 Any notice provided shall be in writing and shall be deemed to be properly given if delivered by hand or sent by first class post, facsimile or by email to the address, facsimile number or email address of the relevant party as may have been notified by each party to the other for such purpose or in the absence of such notification the last known address.
- 11.8 Such notice shall be deemed to have been received on the day of delivery if delivered by hand, facsimile or email and on the second working day after the day of posting if sent by first class post.
- 11.9 The Contract constitutes the entire contract between the parties and shall supersede all previous arrangements between the parties.
- 11.10 Each of the provisions of the Contract is severable and distinct from the others and if one or more provisions is or should become invalid, illegal or unenforceable, the validity and enforceability of the remaining provisions shall not in any way be tainted or impaired.
- 11.11 These terms and conditions shall be governed by and construed in accordance with English law and any proceedings arising out of or connected with these terms and conditions shall be subject to the exclusive jurisdiction of the English courts.
- 11.12 If the Client or Beneficiary has a complaint about the Services, notice should be given in writing to the Compliance Officer at GroundSure who will respond in a timely manner.

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APPENDIX C

Historic Plans

Ordnance Survey® Historical Mapping Extract

www.centremapslive.com

Site Details:

Henthorn Road, Clitheroe

Client Ref: Henthorn Road
Report Ref: CMAPS-843212
Grid Ref: 372940, 440980

Map Name: MasterMap

Map date: 2010

Scale: 1:2,500

Printed at: 1:2,500

2010



Generated from GroundSure Ltd's
high resolution historical mapping
archive. www.groundsure.com



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groundsure@centremaps.com

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Production date: 02 June 2010



Ordnance Survey® Historical Mapping Extract

www.centremapslive.com

Site Details:

Henthorn Road, Clitheroe

Client Ref: Henthorn Road
Report Ref: CMAPS-843212
Grid Ref: 372940, 440980

Map Name: National Grid

Map date: 1995

Scale: 1:2,500

Printed at: 1:2,500

Surveyed 1995
Revised ?
Edition NA
Copyright NA
Levelled NA

Surveyed 1995
Revised ?
Edition NA
Copyright NA
Levelled NA



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Site Details:

Henthorn Road, Clitheroe

Client Ref: Henthorn Road
Report Ref: CMAPS-843212
Grid Ref: 372940, 440980

Map Name: National Grid

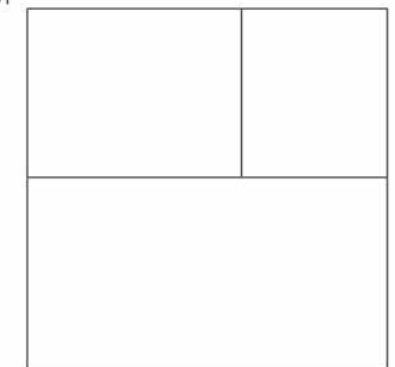
Map date: 1980-1983

Scale: 1:2,500

Printed at: 1:2,500

Surveyed 1961
Revised 1980
Edition NA
Copyright 1980
Levelled 1961

Surveyed 1961
Revised 1983
Edition NA
Copyright 1983
Levelled 1961



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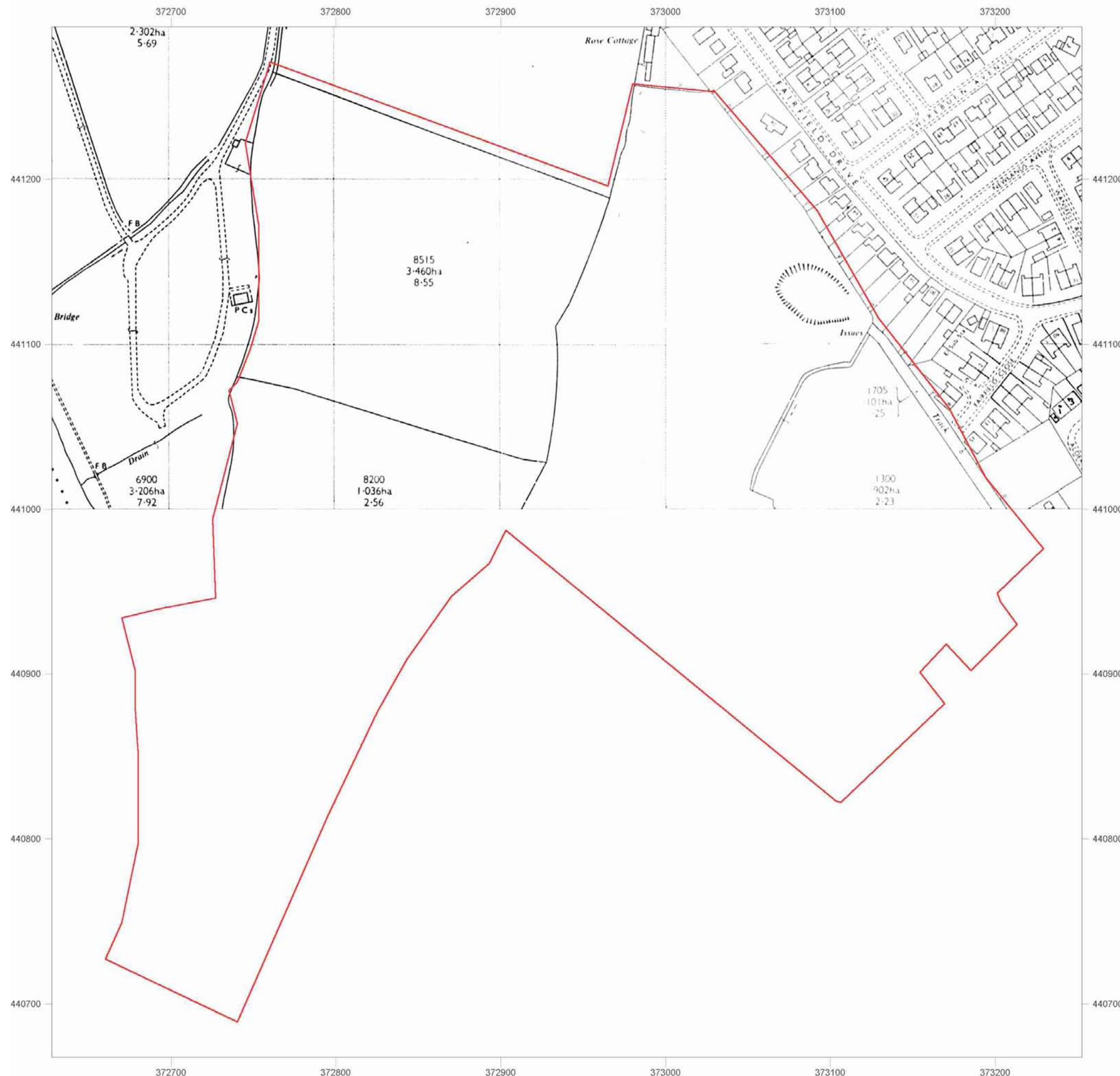


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Site Details:

Henthorn Road, Clitheroe

Client Ref: Henthorn Road
Report Ref: CMAPS-843212
Grid Ref: 372940, 440980

Map Name: National Grid

Map date: 1976-1977

Scale: 1:2,500

Printed at: 1:2,500

Surveyed 1964
Revised 1976
Edition NA
Copyright NA
Levelled NA

Surveyed 1977
Revised 1977
Edition NA
Copyright 1978
Levelled 1961



GroundSure

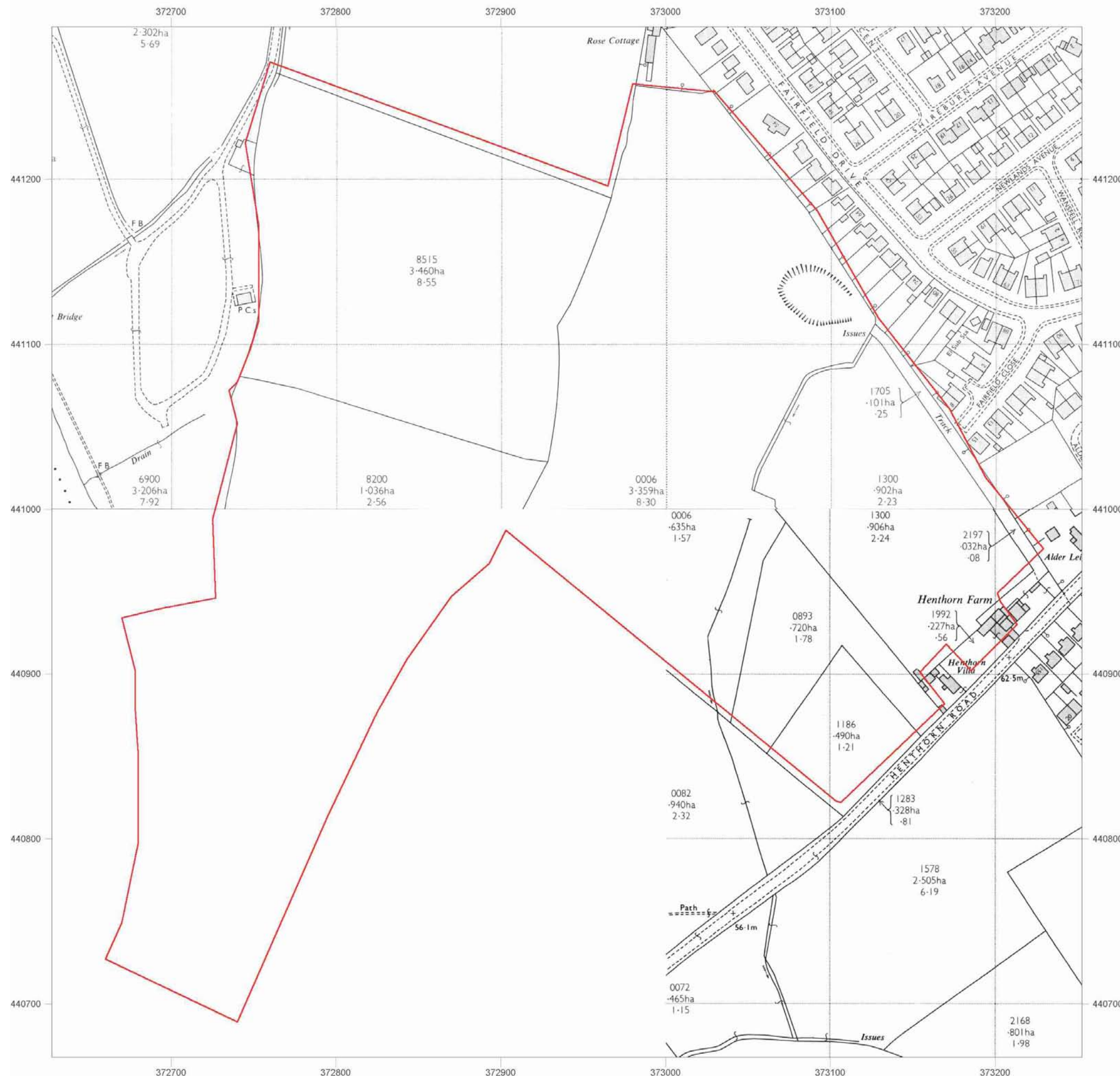
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Site Details:

Henthorn Road, Clitheroe

Client Ref: Henthorn Road
Report Ref: CMAPS-843212
Grid Ref: 372940, 440980

Map Name: National Grid

Map date: 1964

Scale: 1:2,500

Printed at: 1:2,500

Surveyed 1964
Revised 1964
Edition NA
Copyright NA
Levelled NA

Surveyed 1964
Revised 1964
Edition NA
Copyright 1964
Levelled 1961



GroundSure

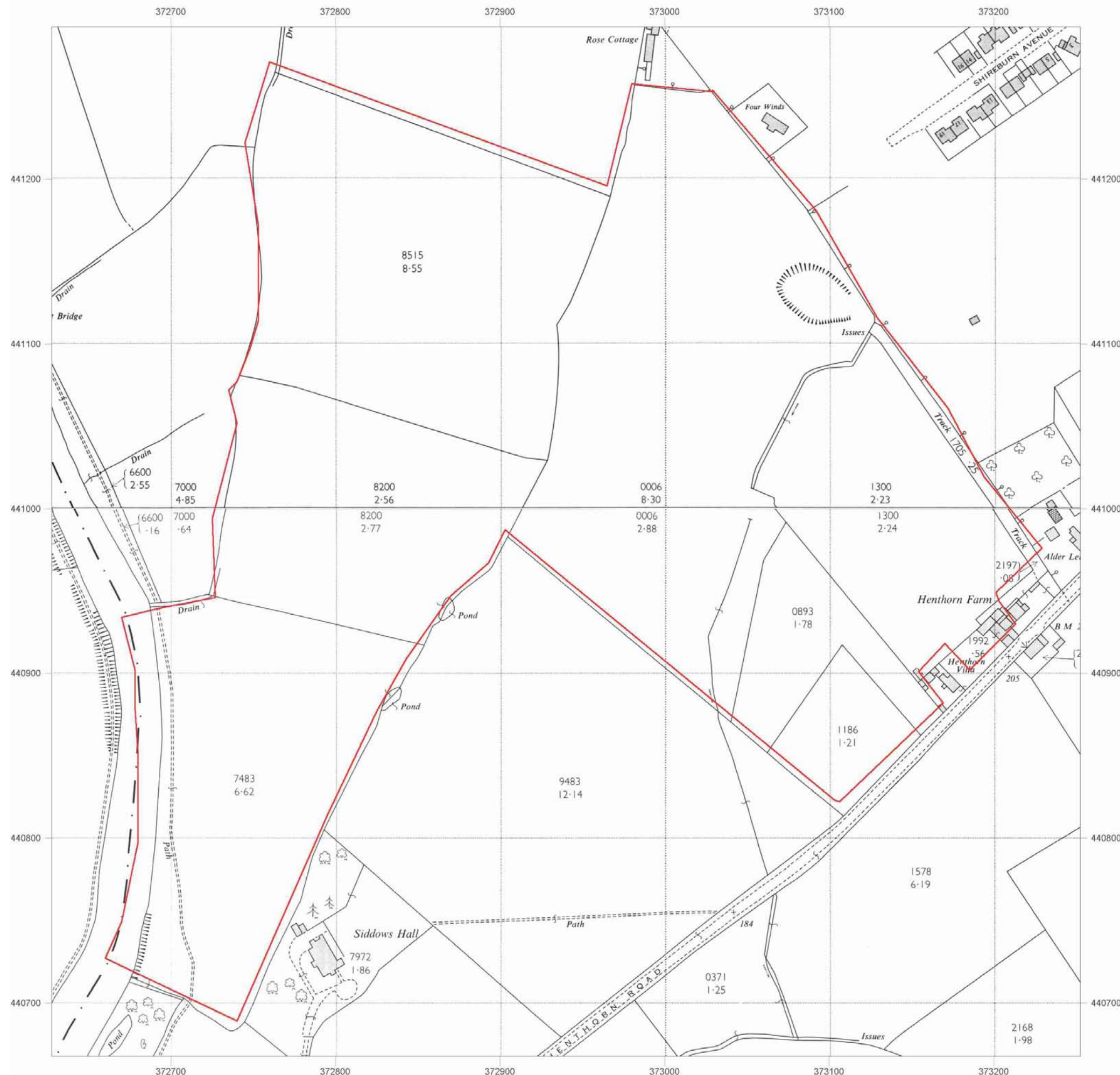
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Site Details:

Henthorn Road, Clitheroe

Client Ref: Henthorn Road
Report Ref: CMAPS-843212
Grid Ref: 372940, 440980

Map Name: County Series

Map date: 1932

Scale: 1:2,500

Printed at: 1:2,500

Surveyed 1932
Revised 1932
Edition NA
Copyright NA
Levelled NA

Surveyed 1932
Revised 1932
Edition NA
Copyright NA
Levelled NA



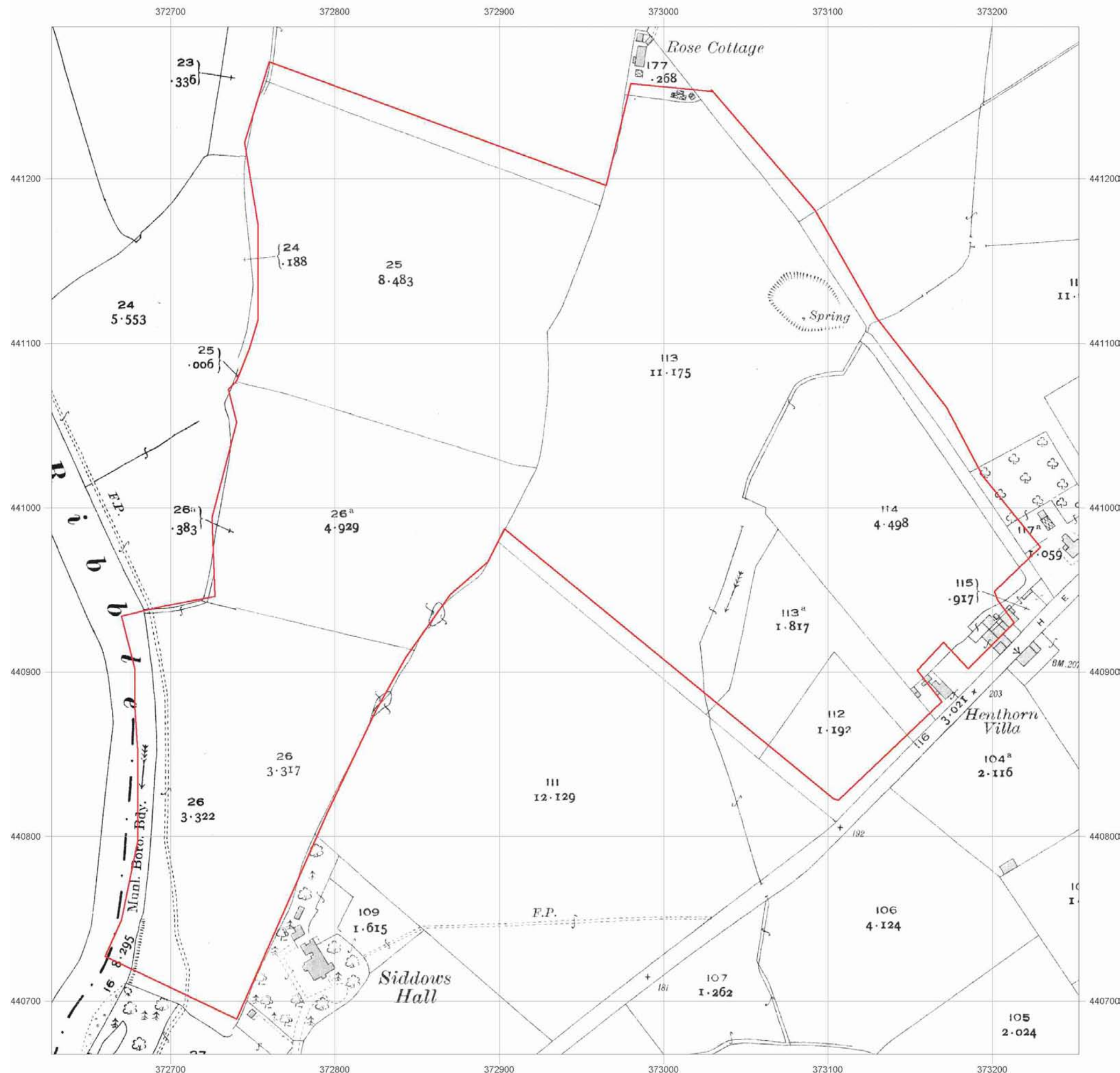
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Site Details:

Henthorn Road, Clitheroe

Client Ref: Henthorn Road
Report Ref: CMAPS-843212
Grid Ref: 372940, 440980

Map Name: County Series

Map date: 1912

Scale: 1:2,500

Printed at: 1:2,500

Surveyed 1912
Revised 1912
Edition NA
Copyright NA
Levelled NA

Surveyed 1912
Revised 1912
Edition NA
Copyright NA
Levelled NA



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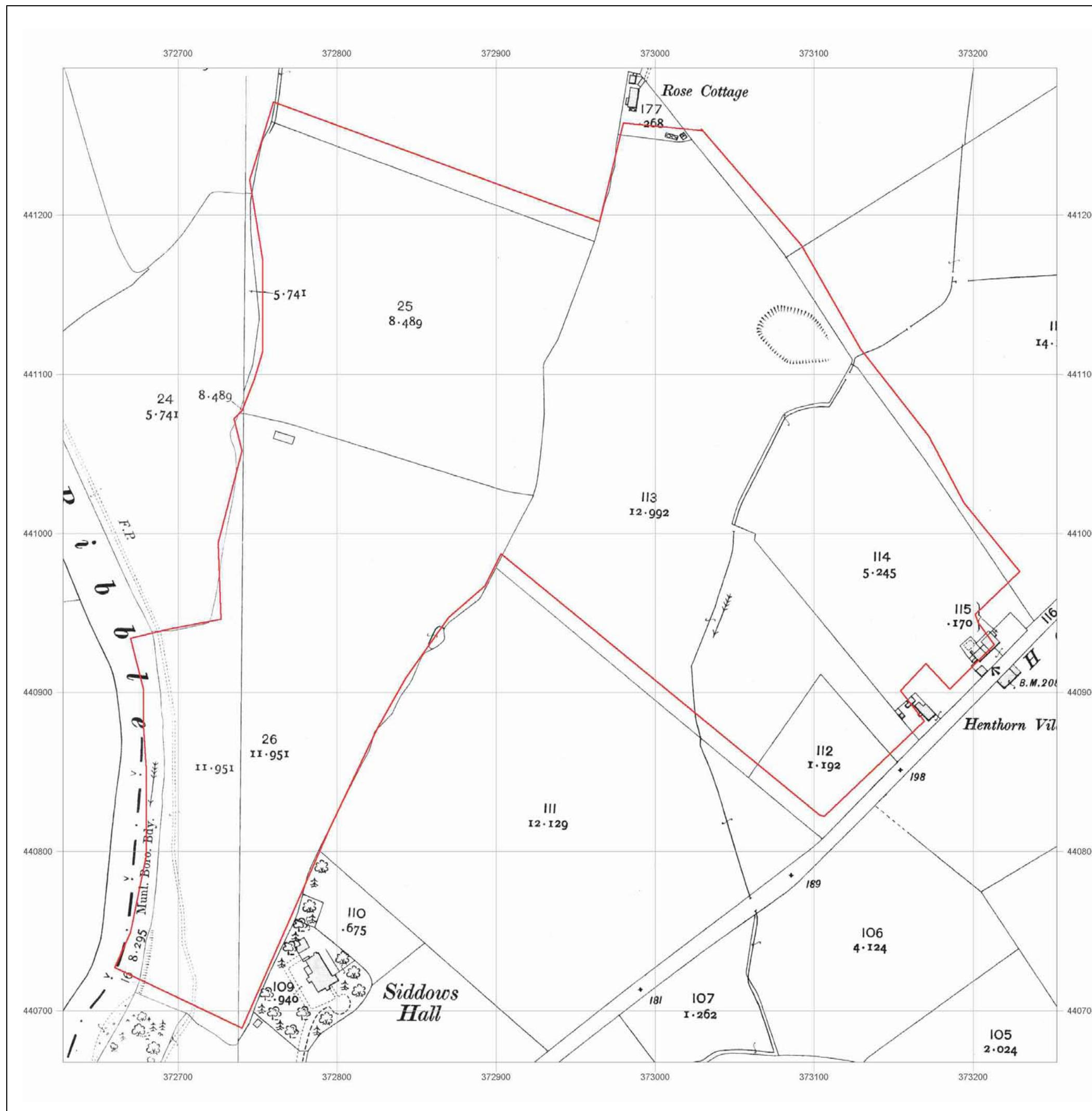
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Site Details:

Henthorn Road, Clitheroe

Client Ref: Henthorn Road
Report Ref: CMAPS-843212
Grid Ref: 372940, 440980

Map Name: County Series

Map date: 1908

Scale: 1:2,500

Printed at: 1:2,500

Surveyed 1908
Revised 1908
Edition NA
Copyright NA
Levelled NA

Surveyed 1908
Revised 1908
Edition NA
Copyright NA
Levelled NA



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Site Details:

Henthorn Road, Clitheroe

Client Ref: Henthorn Road
Report Ref: CMAPS-843212
Grid Ref: 372940, 440980

Map Name: County Series

Map date: 1886

Scale: 1:2,500

Printed at: 1:2,500

Surveyed 1886
Revised 1886
Edition NA
Copyright NA
Levelled NA



GroundSure

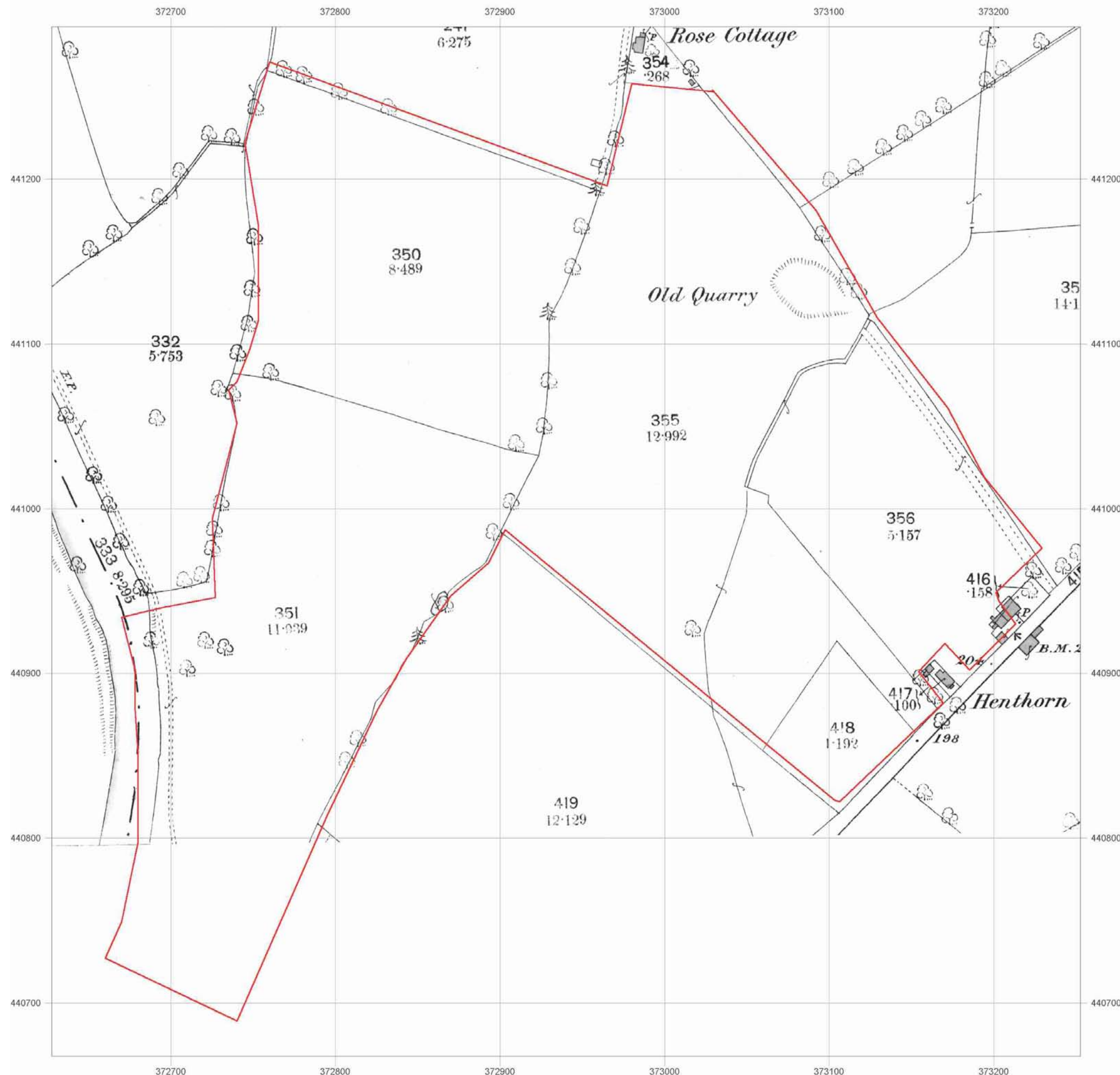
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Production date: 02 June 2010



Ordnance Survey® Historical Mapping Extract

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Site Details:

Henthorn Road, Clitheroe

Client Ref: Henthorn Road
Report Ref: CMAPS-843212
Grid Ref: 372940, 440980

Map Name: County Series

Map date: 1884

Scale: 1:2,500

Printed at: 1:2,500

Surveyed 1884
Revised 1884
Edition NA
Copyright NA
Levelled NA

Surveyed 1884
Revised 1884
Edition NA
Copyright NA
Levelled NA



GroundSure

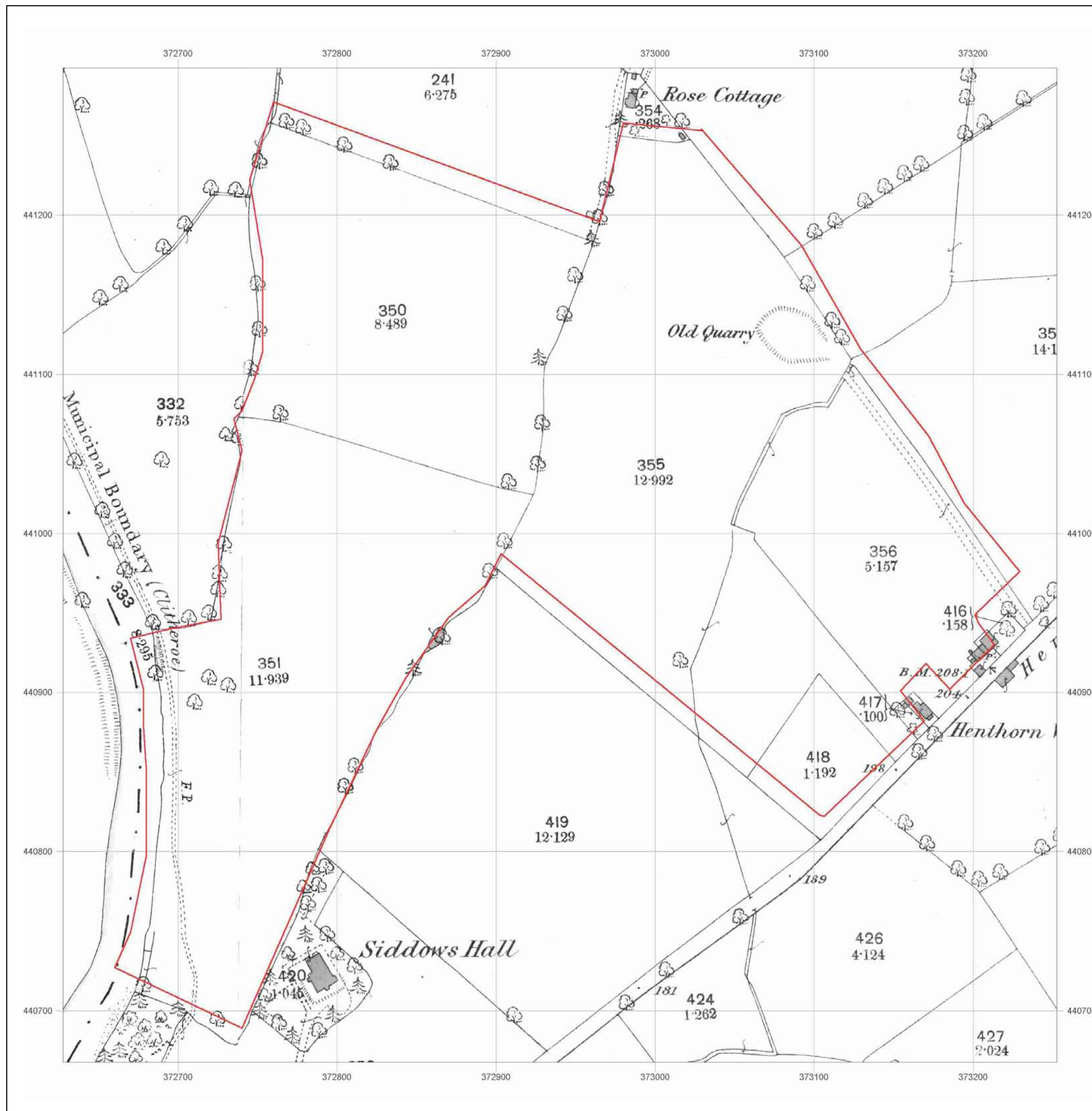
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Production date: 02 June 2010



Ordnance Survey® Historical Mapping Extract

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Site Details:

Henthorn Road, Clitheroe

Client Ref: Henthorn Road
Report Ref: CMAPS-843212
Grid Ref: 372940, 440980

Map Name: National Grid

Map date: 2010

Scale: 1:10,000

Printed at: 1:10,000



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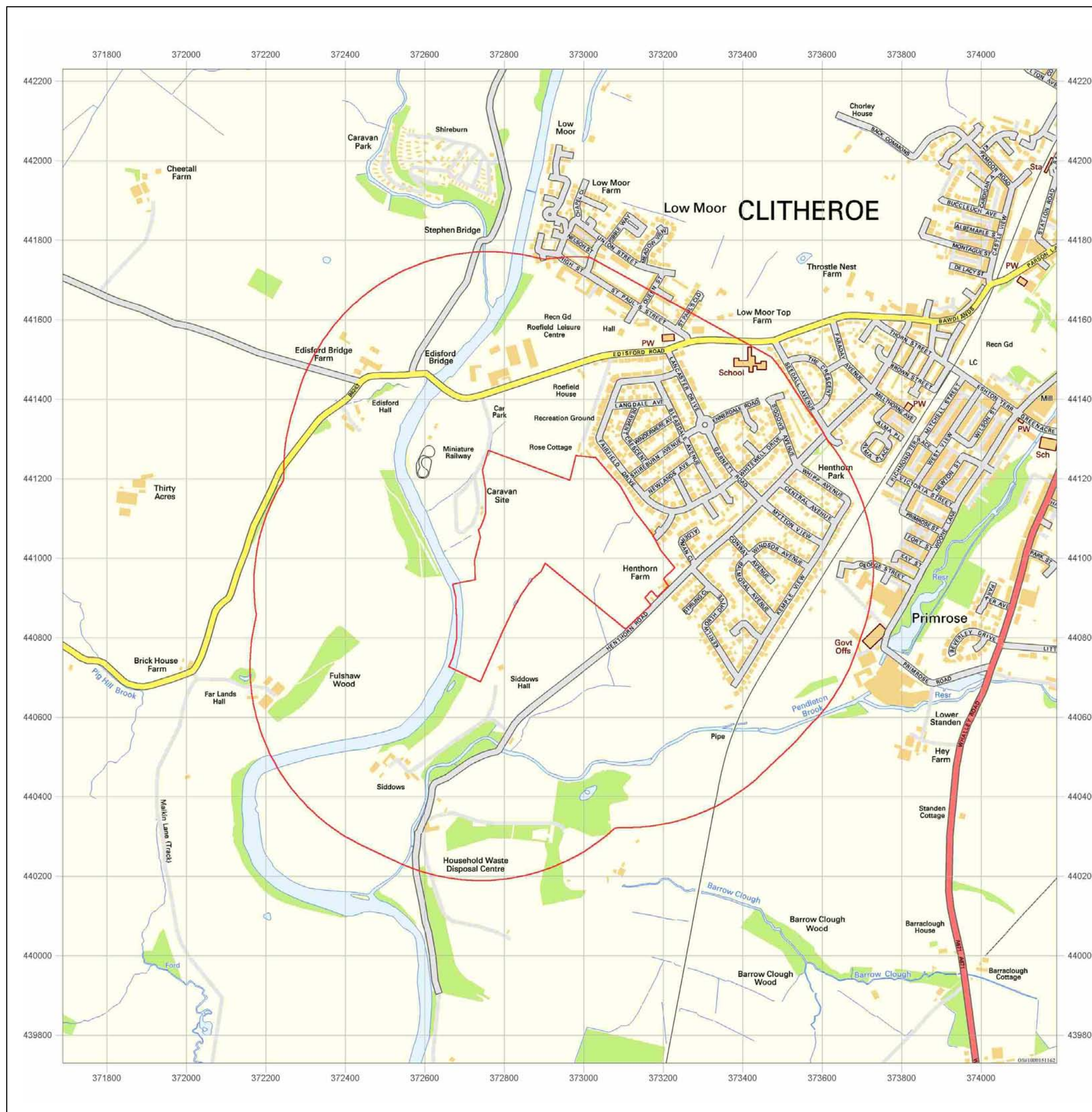


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Grid Ref: 372940, 440980

Map Name: 1:10,000 Raster

Map date: 2002

Scale: 1:10,000

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2002



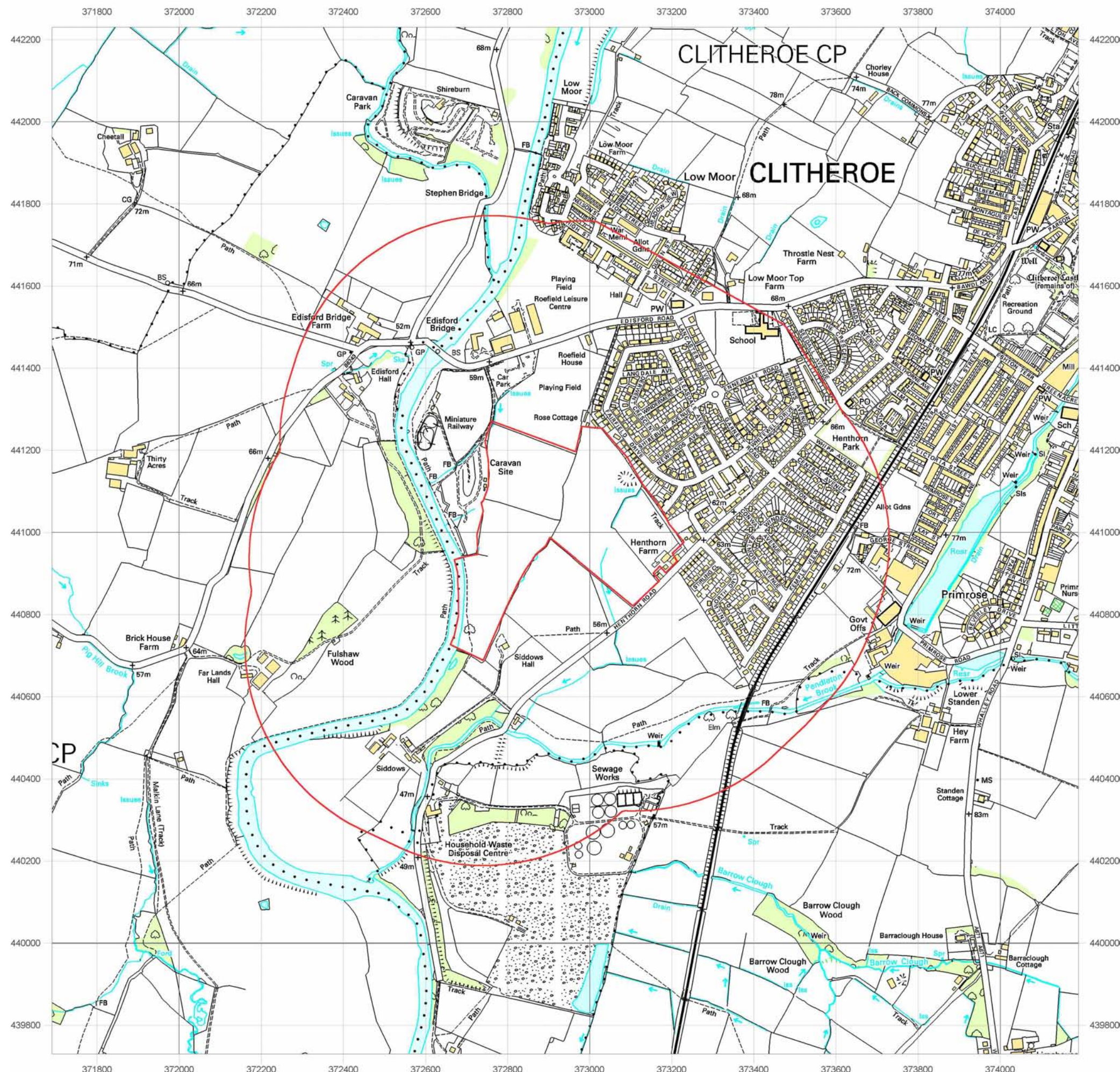
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Map Name: National Grid

Map date: 1971-1973

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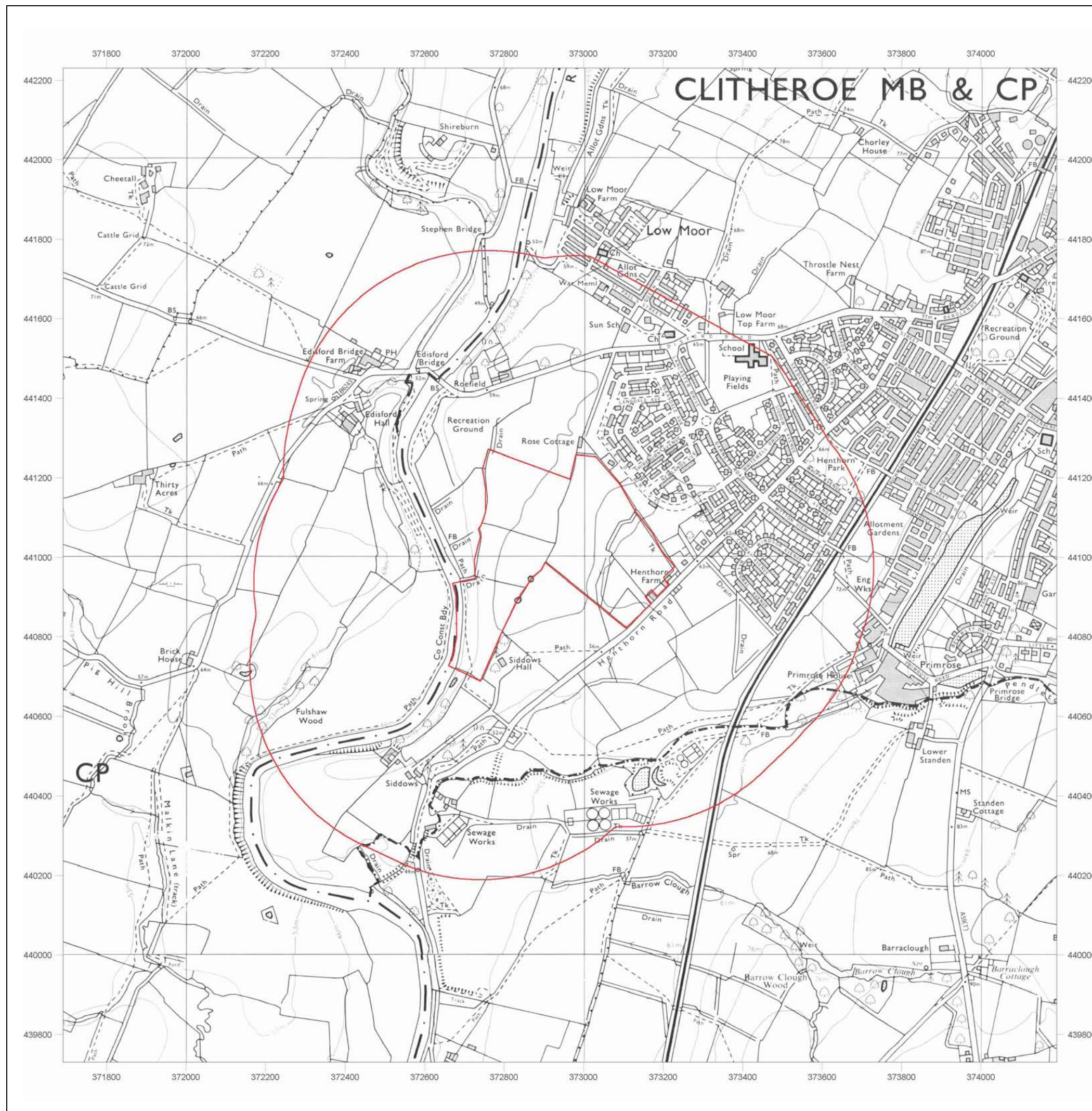
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Henthorn Road, Clitheroe

Client Ref: Henthorn Road
Report Ref: CMAPS-843212
Grid Ref: 372940, 440980

Map Name: Provisional

Map date: 1950

Scale: 1:10,560

Printed at: 1:10,560

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Client Ref: Henthorn Road
Report Ref: CMAPS-843212
Grid Ref: 372940, 440980

Map Name: County Series

Map date: 1938

Scale: 1:10,560

Printed at: 1:10,560

Surveyed 1844
Revised 1938
Edition NA
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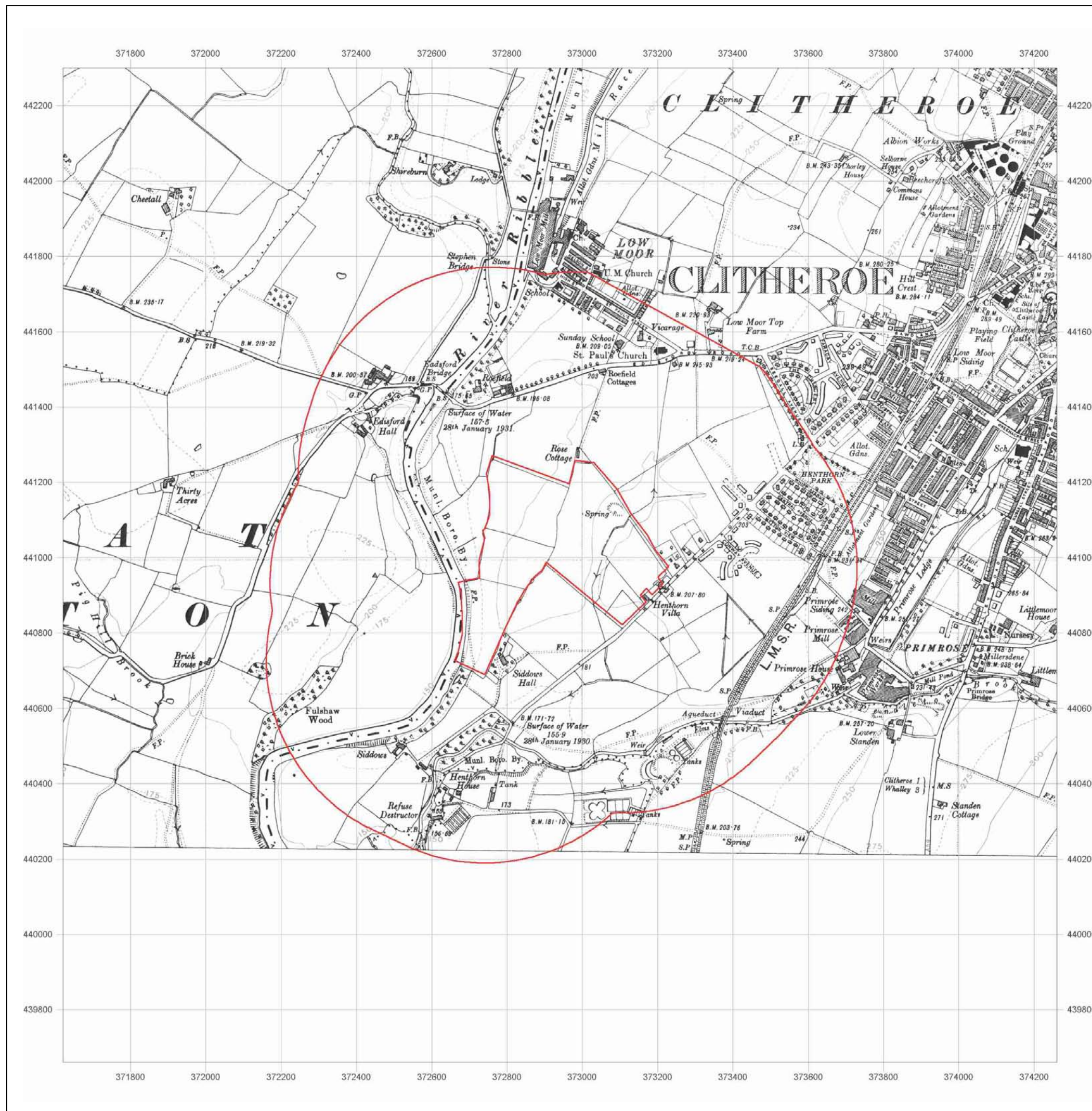
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Client Ref: Henthorn Road
Report Ref: CMAPS-843212
Grid Ref: 372940, 440980

Map Name: County Series

Map date: 1930-1932

Scale: 1:10,560

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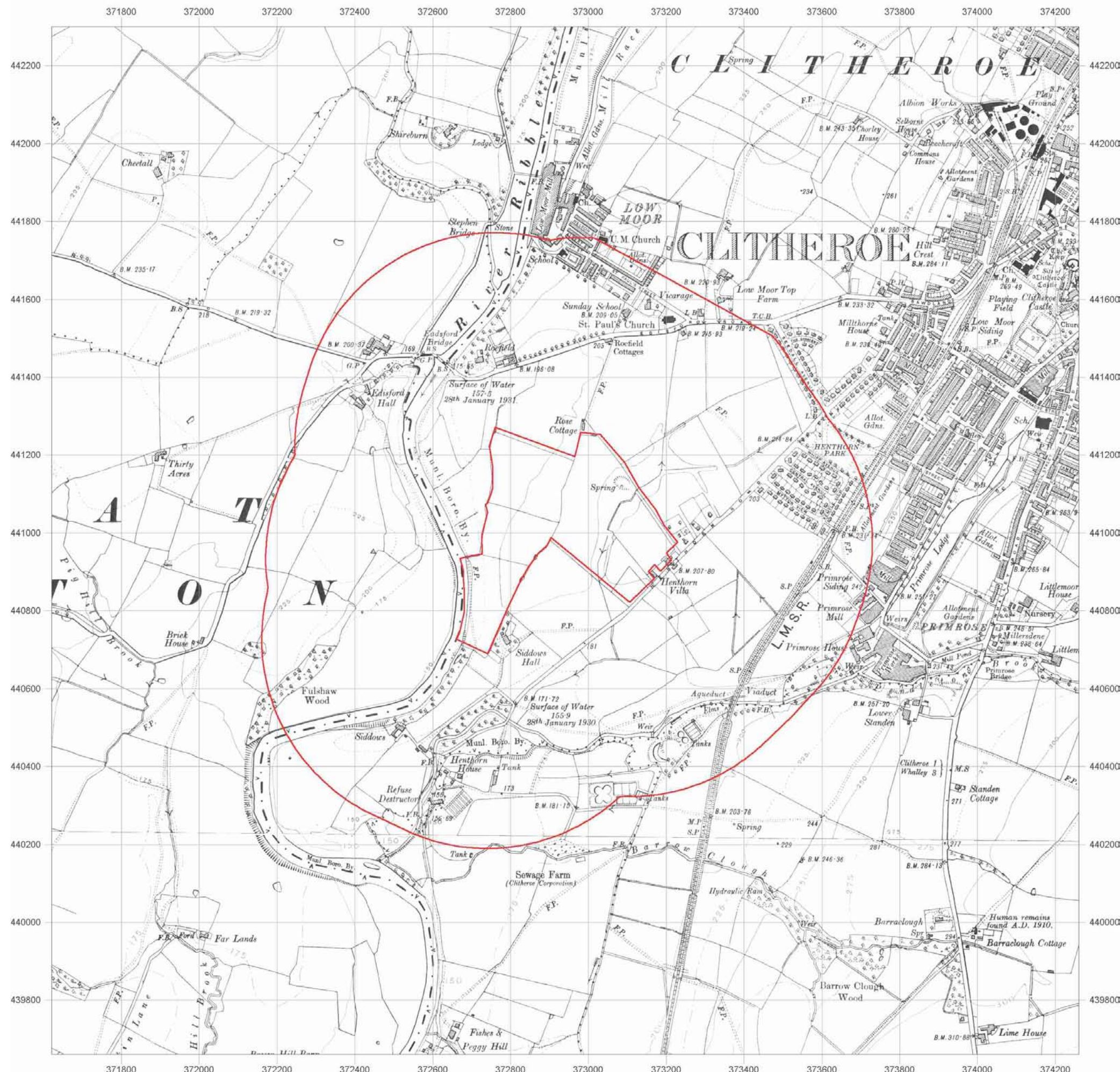
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Client Ref: Henthorn Road
Report Ref: CMAPS-843212
Grid Ref: 372940, 440980

Map Name: County Series

Map date: 1911

Scale: 1:10,560

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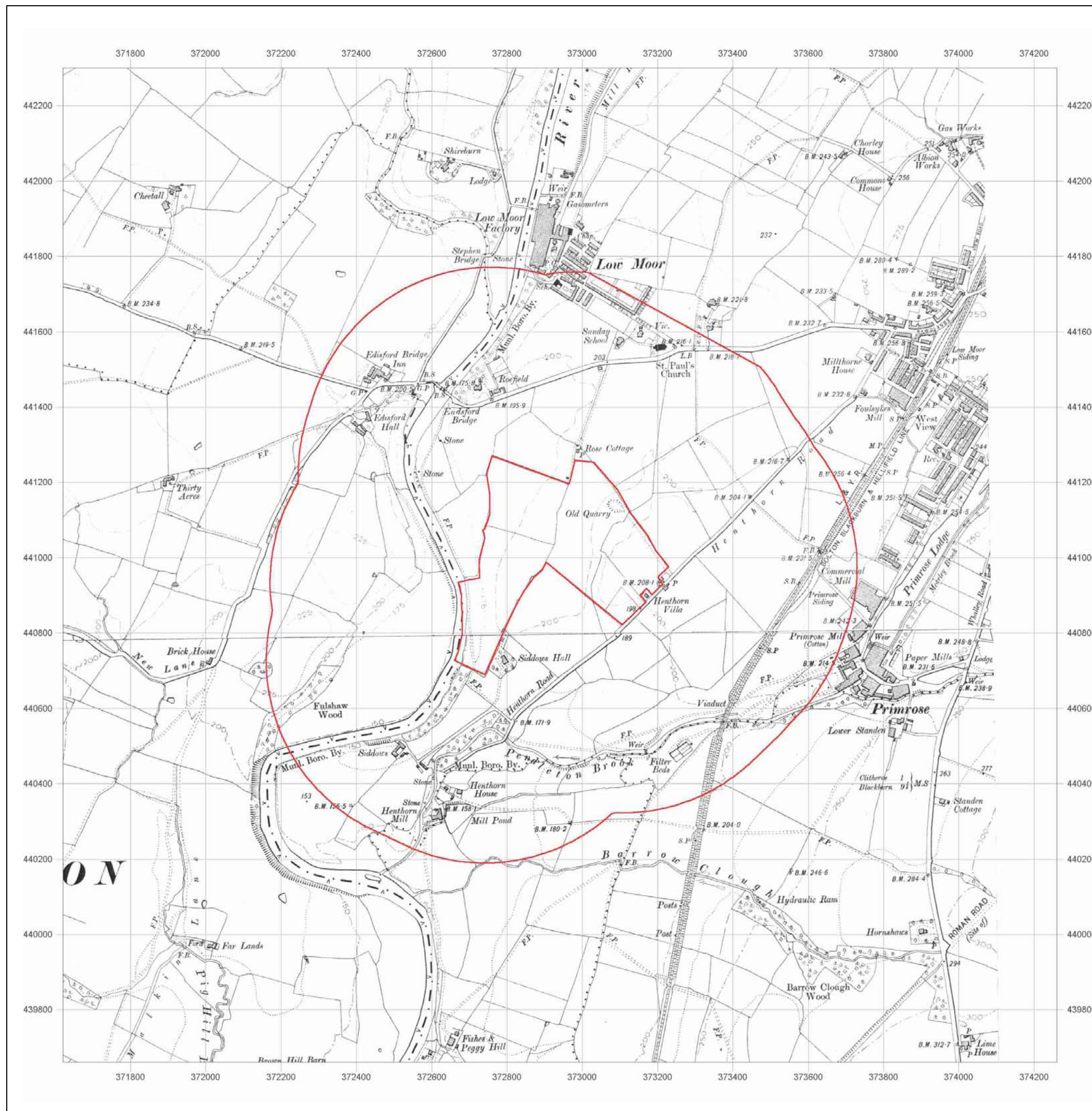
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Report Ref: CMAPS-843212
Grid Ref: 372940, 440980

Map Name: County Series

Map date: 1910

Scale: 1:10,560

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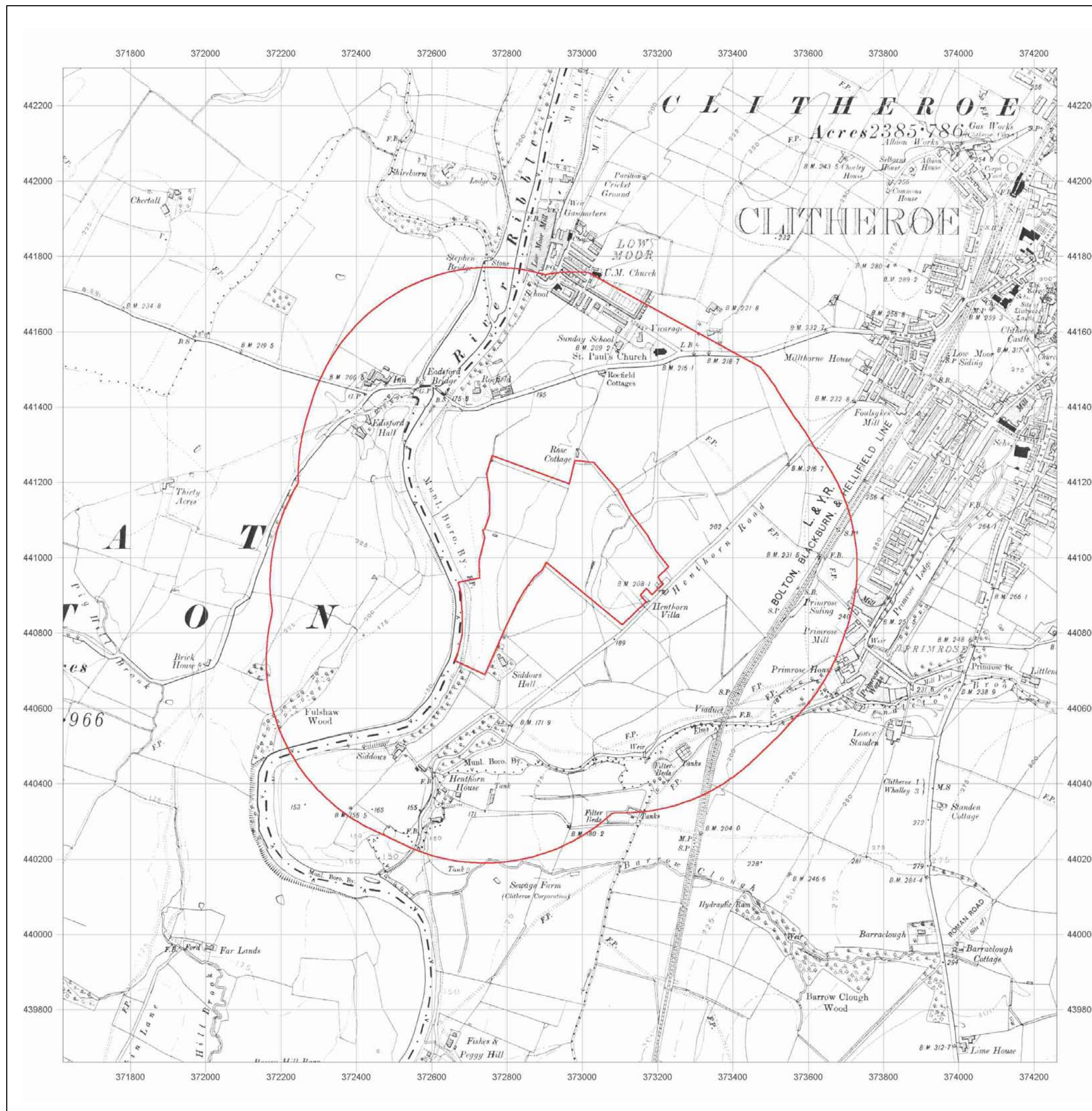


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Report Ref:	Title
J-D0968.00_R1_NLH	GEO-ENVIRONMENTAL INVESTIGATION REPORT For GLADMAN DEVELOPMENTS LIMITED On a site at HENTHORN ROAD, CLITHEROE dated 28 May 2012 Job No: J-D0968.00 by Opus Doncaster



**GEO-ENVIRONMENTAL INVESTIGATION
REPORT**

For

GLADMAN DEVELOPMENTS LIMITED

On a site at

HENTHORN ROAD, CLITHEROE

**GEO – ENVIRONMENTAL INVESTIGATION
REPORT
for
GLADMAN DEVELOPMENTS LIMITED
on a site at
HENTHORN ROAD, CLITHEROE**



28 May 2012

Job No: J-D0968.00

Report Ref: J-D0968.00_R1_NLH

Geo – Environmental Investigation Report

For

Gladman Developments Ltd

On a Site at

Henthorne Road, Clitheroe

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Associate

Date Issued: 28 May 2012
Reference: J-D0968_R1_NLH
Status: Final

CONTENTS

EXECUTIVE SUMMARY

A. FACTUAL INFORMATION.....	1
1.0 INTRODUCTION.....	1
2.0 THE SITE	3
2.1 Location & Access	3
2.2 Site Description	3
2.3 Site Layout	3
3.0 DESK STUDY	5
3.1 Sources of Information	5
3.2 Site History	5
3.3 Geology, Hydrogeology and Hydrology	6
3.4 Mineral Extraction.....	6
3.5 Environmental Considerations.....	7
3.6 Radon.....	7
3.7 Asbestos	7
4.0 PRELIMINARY CONCEPTUAL SITE MODEL.....	8
4.1 Potential Sources of Contamination.....	8
4.2 Receptors of Contamination and Migration Pathways.....	8
4.3 Source-Pathway-Receptors Relationships.....	9
5.0 INVESTIGATION METHODOLOGY.....	11
5.1 Objectives	11
5.2 Clearance of Underground Services.....	11
5.3 Site Works.....	11
5.4 Chemical Laboratory Testing.....	11
5.5 Geotechnical Laboratory Testing.....	12
5.6 Gas/Groundwater Monitoring.....	12
6.1 Strata Encountered.....	13
6.2 Groundwater Observations.....	13
6.3 Chemical Testing.....	13
6.4 Geotechnical Testing.....	16
6.5 Ground Gases	17
B. ASSESSMENT & RECOMMENDATIONS	18
7.0 INTRODUCTION	18
8.0 ENVIRONMENTAL ASSESSMENT	19
8.1 Soil Contamination Summary and Human Health Risk Assessment.....	19
8.2 Controlled Water Risk Assessment	20

8.3	Revised Conceptual Site Model.....	21
8.4	Recommended Remedial Strategy	21
8.5	Health & Safety	21
8.6	Waste Disposal	22
8.7	Service Pipes.....	22
9.0	GEOTECHNICAL ASSESSMENT.....	23
9.1	Foundation Design	23
9.2	Floor Slab Design.....	23
9.3	Building Near Trees.....	23
9.4	Pavement Design	24
9.5	Construction	24
9.6	Soakaways/Drainage.....	24
10.0	FURTHER WORKS.....	25
DRAWINGS		
DO J-D0968_401 R1	Site Location Plan	
DO J-D0968_402 R0	Exploratory Hole and General Site Features Plan	
APPENDICES		
APPENDIX A	Exploratory Hole Records	
APPENDIX B	Contamination Test Results	
APPENDIX C	Geotechnical Test Results	
APPENDIX D	Gas Monitoring Results	

EXECUTIVE SUMMARY

(Henthorn Road, Clitheroe)

Location:	<i>The site is irregularly shaped, approximately 16.4 hectares in area and is situated off Henthorn Road, Clitheroe.</i>
History:	<i>The site is shown as open fields from the earliest plan examined to the present day.</i>
Geology & Hydrogeology:	<i>Solid – Clitheroe Limestone Formation and Hodder Mudstone Formation</i> <i>Drift – Devensian Glacial Till</i> <i>Faults – No known surface faults are shown crossing the site.</i> <i>Groundwater – bedrock is designated as a Secondary (A) Aquifer</i> <i>Surface Water – The nearest watercourse is the unnamed stream located between Field 3 and Field 5. The River Ribble runs broadly north south along the western boundary.</i>
Environmental Considerations:	<i>Landfills – None within 250m of the site.</i> <i>Radon – No radon protective measures required.</i> <i>Pollution Incidents – One recorded on site associated with discharge of sewage.</i>
Mineral Extraction:	<i>Coal Mining – Not affected by coal mining</i> <i>– No faults or other lines of weakness affect the site.</i> <i>Old Quarry known to be present on site.</i>
Ground Conditions:	<i>Brown, clayey topsoil with rootlets was encountered in all machine excavated trial pits and window sample boreholes to an average depth of 0.25m below existing ground level (begl).</i> <i>Underlying the topsoil weathered Glacial Till Deposits were recovered as orange grey mottled, slightly gravelly clay. This was recorded to a maximum depth of 6.0m (begl) in WS6. Silty clay was encountered in a number of exploratory holes but was proven in WS1 from 2.90 to 8.0m (begl).</i>
Contamination Summary:	<i>The made ground to the rear of the 'Old Dairy' and the topsoil within field 5 and within the quarry depression have all recorded benzo(a)pyrene in excess of the relevant IHSV.</i>
Foundation Design:	<i>Strip / trench-fill foundations based at this stage on a safe bearing capacity of 115kN/m² should be suitable for the site.</i>
Floor Slab Design:	<i>Standard suspended beam and block floors.</i> <i>No radon protection required.</i> <i>Ground gas protection precautions may be required (Gas monitoring still ongoing).</i>

Pavement Design:	<i>Assume CBR of 1-2% in Clay, in situ testing required.</i>
Remedial Measures:	<i>Delineation of made ground and validation of capping layer thickness.</i>

A. FACTUAL INFORMATION

1.0 INTRODUCTION

- 1.1 This report describes a geo-environmental investigation undertaken on behalf of Gladman Developments Ltd on a site at Henthorn Road, Clitheroe, Lancashire.
- 1.2 This investigation has been carried out on the assumption that the site is to be developed with residential properties of traditional 2 and 3 storey construction with associated communal landscaped areas and private gardens.
- 1.3 This report has been prepared by Opus International Consultants UK Limited (OIC) with all reasonable skill, care and diligence within the terms of the Contract with the client Gladman Developments Ltd, and taking account of the information made available by the client, as well as the manpower and resources devoted to it by agreement with the client. OIC disclaims any responsibility to the client and others in respect of any matters outside the scope of the above Contract.
- 1.4 The objectives of the investigation were to obtain information relating to the ground conditions at the site in order to determine suitable methods of design and construction for foundations, floor slabs and drainage, for the proposed development and to enable formulation of an appropriate remediation strategy in the context of development proposals.
- 1.5 This report has been produced on behalf of The Client, Gladman Developments Ltd, and no responsibility is accepted to any Third Party for all or any part. This report should not be relied upon or transferred to any other parties without the express written authorisation of OIC. If any unauthorised Third Party comes into possession of this report, they rely on it at their own risk and the authors owe them no duty of care or skill.
- 1.6 The findings and opinions conveyed via the desk study within this report are based on information obtained from a variety of sources, as detailed, which OIC believes are reliable. Nevertheless, OIC cannot and does not guarantee the authenticity or reliability of the information it has relied upon from these sources.
- 1.7 Whilst this report may express an opinion on the possible configuration of strata, contaminants or gases between or beyond exploratory hole positions or on the possible presence of features based on either visual, verbal or published evidence, this is for guidance only, and no liability can be accepted for its accuracy.
- 1.8 The comments on groundwater and ground gas conditions are based on observations made at the time of the investigation. It should be noted, however, that groundwater and ground gas levels may vary from those reported due to seasonal or other effects.
- 1.9 Although every effort has been made to position exploratory holes in the least sensitive areas of the site, exploratory hole positions were located approximately as part of this investigation and no guarantee can be given as to their accuracy. Consideration should be given to the possibility that exploratory holes excavated as part of this investigation, and indeed any previous ground investigation work by others, may be encountered

beneath or within the influence of individual foundations. OIC cannot be held responsible for failure of excavations or structural failures caused by the location of foundations of any form of structure within the influence of exploratory holes.

- 1.10 Existing manhole covers were not lifted and drainage runs were not inspected during the course of this ground investigation.
- 1.11 The site plans enclosed in this report should not be used for scaling purposes.

2.0 THE SITE

2.1 Location & Access

- 2.1.1 The site is situated off Henthorn Road, Clitheroe, as shown on appended Drawing No. DO J-D0968_401, is centred on approximate National Grid Reference 373200, 440943.
- 2.1.3 Access to the site can be gained off Henthorn Road which is located to the south of the site.

2.2 Site Description

- 2.2.1 The site is irregularly shaped, approximately 16.4 hectares in area and is currently grassed and utilised for grazing pastures. The majority of the site's boundaries are marked by hedgerows with occasional mature trees, wooden post fencing was also present.
- 2.2.2 The north-western area of the site is bound by playing fields (football pitches) with residential housing extending along the north-eastern site boundary.
- 2.2.3 The south eastern site boundary is marked by the rear gardens of residential properties fronting onto Henthorn Road. The 'Old Dairy' is within the site boundaries, whilst the remaining properties are located off site. Henthorn Road, running northeast to southwest, is located along the south eastern site boundary.

2.3 Site Layout

- 2.3.1 For ease of reporting the site can be divided into five fields numbered 1 to 5, as shown on OIC drawing DO J-D0968_402 R0. Each of the fields comprised long grasses. The fields were divided by hedgerows predominantly comprising hawthorn with occasional mature trees such as oak and ash.

Field 1

- 2.3.2 Field 1 forms the south western area of the site. The field is roughly triangular in shape, the field slopes steeply west towards the River Ribble. The field is accessed via a gated area from Field 3.

Field 2

- 2.3.3 Field 2 forms the north western area of the site. The field is broadly square in shape and gently slopes towards the western boundary.
- 2.3.3 Two access gateways were located in the field, one in the south eastern corner leading to field 1, and a second in the north eastern corner leading to Field 3.

Field 3

- 2.3.4 Field 3 formed the central part of the site and was roughly rectangular in shape. The field was generally flat, sloping very gently towards the north east. A circular depression, with a diameter of approximately 18m and a depth of 1.5m, was located in the north-east of

the field. The field has five access gateways, one in the north west leading to Field 2, one in the south west leading to Field 1, one in the north east leading to Field 4 and two in the centre of the eastern boundary leading to Field 4 and 5.

Field 4

- 2.3.5 Field 4 is located to the north east of the site, the boundaries of which comprise the rear garden areas of properties fronting onto Fairfield Close to the north and Henthorn Road to the east. The field is accessed in the northwest and southwest from Field 3 and via land present adjacent to the southern boundary of 'The Old Dairy' on the eastern boundary of the site, off Henthorn Road.

Field 5

- 2.3.6 Field 5 is irregular in shape and located in the south east of the site, access to the field is gained via a gate in the north east, onto Henthorn Road and to the north west to Field 3. The field is relatively flat starting to slope quickly towards the west and south west towards a small stream.

3.0 DESK STUDY

3.1 Sources of Information

3.1.1 The following sources of information have been consulted as part of the desk study for the site;

- (a) Envirocheck Environmental Report.
- (b) British Geological Survey 1:50,000 Sheet 68 'Clitheroe'.
- (c) BRE 211 – Radon, guidance on protective measures for new buildings.
- (d) Law Society Guidance Notes and Directory for Coal Mining Searches.
- (e) The Coal Authority, Mansfield.
- (f) Historical County Series and Ordnance Survey plans.
- (g) JPB Desk Study Report Ref: KB450-03/AES/HB/GP

3.2 Site History

3.2.1 The history of the described in detail within the enclosed JPB Phase 1 Desk Study Report (Ref: KB450-03/AES/HB/GP), however a summary is provided below;

On site

- 3.2.2 The 1884 map shows the site and its surroundings to have been predominantly fields, divided by tree lined field boundaries. A watercourse is shown to have trended north to south in the east of the site and a pond was located on the 'v' shaped southern site boundary. The River Ribble is also shown to have trended north to south in the southwest of the site with a footpath running within the site boundary.
- 3.2.3 Henthorn Road is already constructed on the earliest plan reviewed and is present to the southeast of the site, with buildings shown along it annotated as 'Henthorn Villa'. A track is noted to have trended from Henthorn Road in the far southeast of the site, along the northeast site boundary, to a feature that is annotated as 'old quarry'.
- 2.2.4 No changes are noted on site until 1910 where a small building is shown to have been constructed centrally along the western site boundary. This building is only shown between 1910 and 1912 and is likely to have been agricultural in nature.
- 2.2.5 A second pond is annotated along the 'v' shaped southern boundary on the 1932 plan and a land drain is shown to feed into the River Ribble in the far west of the site. These features still remain present today.
- 2.2.6 'Henthorn Villa' is first shown as 'Henthorn Farm' on the 1964 map. No further significant changes are noted on site from this time to present day.

Off Site

- 2.2.6 The site was situated predominantly within open fields throughout the first part of the 1900s. The main features of note, from the late 1800s to the mid 1900s, are Rose Cottage which was situated immediately north of the site and Siddows Hall, located immediately south of the site. Further afield the Lancashire & Yorkshire Railway Line (Bolton, Blackburn & Hellifield) is shown to have trended from the northeast to the south

approximately 450m east of the site, with the town of Clitheroe trending north-easterly beyond. Filter beds are shown to have been located approximately 350m south of the site and a Sewage Farm (Clitheroe Corporation) is shown to have extended from approximately 500m away.

- 2.2.7 The 1930 map shows a refuse destructor to have been located approximately 400m south of the site. By the early 1970s the Sewage Farm is shown as a Sewage Works with various tanks present and the refuse destructor is no longer annotated. The 2002 map annotates a Household Waste Disposal Centre and landfill site to have been present from approximately 400m south of the site, in the vicinity of the former refuse destructor and Sewage Works.
- 2.2.8 From the mid 1950s, residential development is shown to have commenced northeast of the site, with the development shown as present day by the 2002 plan edition. Recreation ground is shown immediately north and northwest of the site in the 1970s, which is, in part, developed as a caravan site and miniature railway (west of site) by 2002. No further significant changes are noted.

3.3 Geology, Hydrogeology and Hydrology

- 3.3.1 According to the inspected published geological information the site is shown to be underlain by superficial deposits of Devensian Glacial Till. These deposits typically comprise consolidated clay with gravel and occasional layers of sand.
- 3.3.2 The underlying bedrock strata is mapped as the Clitheroe Limestone Formation and Hodder Mudstone Formation (Undifferentiated).
- 3.3.3 No surface faults are shown to affect the site, or immediate surrounding areas.
- 3.3.4 According to Environment Agency (EA) the superficial strata beneath the site are designated as unproductive strata. These are deposits with low permeability that have negligible significance for water supply or river base flow.
- 3.3.5 The bedrock is designated as a Secondary (A) Aquifer (formerly minor aquifer). These deposits are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.
- 3.3.6 The nearest watercourse to the site is the unnamed stream located between Field 3 and Field 5. The River Ribble runs broadly north south along the western boundary.

3.4 Mineral Extraction

- 3.4.1 The Coal Authority and Law Society Gazetteer of England and Wales does not list Clitheroe as an area where a coal mining report is required.
- 3.4.2 The historical plans show a quarry to be present in field 3.

3.5 Environmental Considerations

3.5.1 Specific details relating to the environmental setting taken from the JPB Desk Study Report Ref: KB450-03/AES/HB/GP are detailed below.

- Henthorn Road Landfill Site, a historic and active landfill site is located 300m south of the site.
- An historic quarry is present on site. The quarry is not believed to have been in filled historically.
- The GroundSure Report indicates that there is one pollution incident recorded on site which causes a Category 2 (significant) impact to the onsite watercourse. The incident occurred in July 2006 and was as a result of crude sewage being discharged.
- There is one recorded discharge consent for the site, which was originally registered in 1995. This licence was revoked in 2009 and reissued. The existing licence is for storm overflow (sewage discharges) to the watercourse trending north to south through the central part of the site. There are five further licensed discharge consents for storm overflow – sewage discharges within a 500m radius of the site.

3.5.2 In addition to the above, it was also noted that there was the potential for ground gas generation to affect the site, associated with possible peat deposits within the alluvium deposited by the River Ribble.

3.6 Radon

3.6.1 The Building Research Establishment have produced their revised document BR211 (“Radon guidance on protective measures for new buildings” 2007 Edition). This provides a staged framework to determine whether radon protective measures should be afforded to new dwellings.

3.6.2 The site lies within an area requiring **no** radon protective measures.

3.7 Asbestos

3.7.1 No buildings are known to have been present on the site and the ground investigation encountered no evidence of asbestos on this site.

4.0 PRELIMINARY CONCEPTUAL SITE MODEL

4.1 Potential Sources of Contamination

4.1.1 The following potential **on site** sources of ground contamination have been identified:

- Potential for pesticides from historical use as a farmer's field.
- Potential made ground in area towards 'Old Dairy'.
- Potential made ground associated with any potential backfilling of the former on site quarry.

4.1.2 There have been no major potential **off site** sources of ground contamination identified.

4.2 Receptors of Contamination and Migration Pathways

4.2.1 Receptors are defined as human or non-human organisms that have the potential to experience adverse effects from direct or indirect exposure to contaminated material.

4.2.2 Migration pathways are defined as the courses chemicals take from a source to an exposed organism or receptor. The exposure pathway can be direct (ie stays within the same exposure media) or indirect transport from one medium to another takes place.

4.2.3 The following potential human health and environmental receptors have been identified:

- Future site occupants
- Site construction and maintenance workers
- Neighbouring occupants

4.2.4 The following potential migration pathways have been identified:

• Inhalation

Breathing dust and vapours from contaminated soil in outdoor air. Vapours can also migrate into buildings resulting in inhalation by the occupants.

• Ingestion

Eating and swallowing of contaminated soil and/or groundwater either by deliberate consumption, indirectly by eating or smoking with dirty hands or by ingestion of fugitive dust.

• Dermal Contact

Direct contact with contaminated soil and groundwater, causing skin conditions such as dermatitis etc. Certain contaminants can be absorbed into the body through the skin or enter directly through open cuts or abrasions.

- **Migration of Contaminated Water**

Contaminated groundwater can migrate laterally or vertically dependent on permeability, preferential pathways, man-made voids etc.

- **Leaching**

Infiltration of water through soil can leach out soluble contaminants resulting in groundwater pollution.

- **Aggressive Attack**

Building materials can be damaged by direct contact with aggressive ground conditions, for example sulphate attack on concrete and hydrocarbon attack on plastics.

- **Uptake by Plants and Vegetables**

Some contaminants may be toxic to plants but not necessarily to human health at the same concentrations. In addition, plants may uptake contaminants through their roots, which in the case of homegrown vegetables may later be consumed by humans. Contaminated soil adhered to vegetables can also be potentially ingested if not properly washed before consumption. Plant growth can also be adversely affected by landfill gas.

4.3 Source-Pathway-Receptors Relationships

4.3.1 The following potential **Source-Pathway-Receptor** relationships have been identified for the site bearing in mind the development proposals;

Source	Pathway	Receptor
Contaminated soil	Ingestion Dermal contact Inhalation (outdoor air)	Construction workers Future occupants
Contaminated soil	Inhalation (indoor air)	Future occupants
Contaminated soil	Leaching and migration	Controlled waters
Contaminated soil & groundwater	Aggressive attack	Building materials
Contaminated soil	Root uptake to plants	Future occupants
Contaminated groundwater	Ingestion Dermal contact Inhalation (outdoor air)	Construction workers Future occupants
Contaminated groundwater	Inhalation (indoor air)	Future occupants

Source	Pathway	Receptor
Contaminated groundwater	Exposure during earthworks	Construction workers
Contaminated groundwater	Migration to surface water courses	Controlled waters
Ground Gas from alluvial deposits	Migration of ground gases	Future occupants

5.0 INVESTIGATION METHODOLOGY

5.1 Objectives

5.1.1 The objectives of the investigation were to address the following;

- Determine ground conditions for the purpose of constructing residential dwellings.
- Determine foundation solutions for proposed residential dwellings.
- Carry out an environmental assessment of the ground in relation to any likely contamination affecting the end use of dwellings with residential gardens.

5.2 Clearance of Underground Services

5.2.1 Before intrusive works were undertaken, the positions of exploratory holes were agreed with the site owner in order to avoid underground services. All positions were scanned with a cable avoidance tool (CAT) as a further precautionary measure.

5.3 Site Works

5.3.1 Nineteen trial pits (TP1 to TP19), five shallow CBR trial pits (CBR1-CBR5), nine window sample holes (WS1, WS2a, WS2b WS3-WS8) were undertaken between 02nd May 2012 and 04th May 2012 utilising a JCB 3CX wheeled excavator and a Premier Compact Window Sampling Rig to depths ranging between 0.50m and 8.00m below existing ground level (begl).

5.3.2 Disturbed samples were taken at selected intervals from the strata encountered, placed in appropriate containers and submitted for geotechnical and chemical testing.

5.3.3 The approximate locations of the exploratory holes are shown on the appended Drawing No. DO J-D0968.00_402 Sheets 1 and 2 and the exploratory hole logs are presented in Appendix 'A'.

5.4 Chemical Laboratory Testing

5.4.1 As part of the assessment for potential contamination at the site, thirteen soil samples were subjected to appropriate chemical analysis. This analysis was carried out at the UKAS and MCERTS accredited laboratory of SAL for a suite of determinands chosen bearing in mind the potential contaminants on site.

5.4.2 The following analyses were carried out:

- | | | |
|--|---|------------|
| • General Screening suite (including metals) | - | 20 samples |
| • Pesticide Suite | - | 10 samples |
| • Concrete Classification Testing | - | 5 samples |
| • Total Petroleum Hydrocarbons | - | 5 samples |

- Asbestos Screen - 6 samples

5.4.3 Results of the chemical testing are presented in Appendix 'B'.

5.5 Geotechnical Laboratory Testing

5.5.1 Six representative samples of natural clay shown in the table below were submitted to PSL Ltd, a UKAS accredited testing laboratory, for determination of the modified plasticity index in accordance with NHBC Standards. The geotechnical test results (in-situ and laboratory) are enclosed as Appendix 'C'.

Location	Depth (m) (begl)	Sample No	Description	Analysis
TP8	1.3	D20	Gravelly CLAY	Atterberg Limits & Natural Moisture Content
TP15	1.9	D38	Gravelly CLAY	Atterberg Limits & Natural Moisture Content
TP17	0.9	D42	Gravelly CLAY	Atterberg Limits & Natural Moisture Content
WS1	2.8	D102	Gravelly CLAY	Atterberg Limits & Natural Moisture Content
WS3	3.0	D107	Sandy gravelly CLAY	Atterberg Limits & Natural Moisture Content
WS8	0.6	D115	Sandy gravelly CLAY	Atterberg Limits & Natural Moisture Content

5.6 Gas/Groundwater Monitoring

5.6.1 The information available indicates that landfills are not present within the site or within proximity to the site boundaries. However, there is the potential for organic rich deposit to exist locally, particularly in the south west, where alluvial deposits are anticipated. Therefore as part of the window sample investigation five number gas monitoring wells were installed on site.

5.6.2 To date three visits have been completed during which concentrations of carbon dioxide, methane, oxygen, carbon monoxide and hydrogen sulphide have been recorded, along with gas flow rates, atmospheric pressure and groundwater depth below existing ground level. The results of the monitoring completed to date are presented in Appendix 'D'.

6.0 RESULTS OF THE INVESTIGATION

6.1 Strata Encountered

- 6.1.1 Made ground was encountered at five locations in the east of the site (CBR4, CBR5, CBR6, TP19 and WS4). The made ground encountered generally comprised topsoil with a small proportion of gravel sized fragments of brick, sandstone, timber, concrete blocks and metal.
- 6.1.2 Brown, clayey topsoil with rootlets was encountered in all machine excavated trial pits and window sample boreholes to an average depth of 0.25m below existing ground level (begl).
- 6.1.3 Underlying the topsoil weathered Glacial Till Deposits were recovered as orange grey mottled, slightly gravelly clay. This was recorded to a maximum depth of 6.0m (begl) in WS6. Silty clay was encountered in a number of exploratory holes but was proven in WS1 from 2.90 to 8.0m (begl).

6.2 Groundwater Observations

- 6.2.1 No groundwater seepages were encountered during the investigations, however groundwater was recorded within some of the ground gas/water monitoring installations during subsequent monitoring.
- 6.2.2 Areas of the site were noted to be waterlogged with standing water present locally during monitoring visits.

6.3 Chemical Testing

- 6.3.1 The results of the chemical testing on soil samples have been reviewed in accordance with the legislative framework and criteria set out in Appendix 'B'.
- 6.3.2 From the ground investigation the following strata types were identified;
- Topsoil
 - Orange grey Clay subsoil
 - Grey brown, gravelly Clay
 - Made Ground from trial pit TP19
- 6.3.3 Where possible the results of the analysis have been assessed using statistical analysis as outlined in CLAIRE 'Guidance on Comparing Soil Contamination Data with a Critical Concentration' Dated May 2008. Appropriate UCL (Upper Confidence Limit) values have been calculated for those identified strata types with sufficient analysis (i.e. three or more test results). The selected critical concentrations are detailed in section 8.
- 6.3.4 The results of the chemical testing are enclosed as Appendix C, however the detectable determinands are summarised in the following sections and tables:

6.3.5 Topsoil

Ten samples of this material have been tested, the results of the analysis completed are summarised below

This material was found to have a Total Organic Carbon of between 3.3% and 9.9%, the average value being 5.8, which equates to a Soil Organic Matter (SOM) of 9.9%.

This material was found to have a pH value of between 6.0 and 7.2, with an average value of 6.7.

Determinand	Units	Range of Concentrations recorded	Upper Confidence Limit	Critical Concentration at 6 % SOM
Arsenic	mg/kg	12-17	15	32
Chromium	mg/kg	27-180	113	3000
Copper	mg/kg	21-110	78	8340
Lead	mg/kg	57-150	137	450
Nickel	mg/kg	18-97	67	130
Zinc	mg/kg	140-250	202	38000
Naphthalene	mg/kg	<0.1-0.3	0.2	8.7
Acenaphylene	mg/kg	<0.1-0.4	0.15	850
Acenaphthene	mg/kg	<0.1-1.3	0.3	18.0
Fluorene	mg/kg	<0.1-0.7	0.4	2700
Phenanthrene	mg/kg	<0.1-8.3	5.2	380
Anthracene	mg/kg	<0.1-1.8	1.1	9420
Fluoranthene	mg/kg	<0.1-8.9	6.3	2160
Pyrene	mg/kg	<0.1-7.4	5.3	1560
Benzo(a)Anthracene	mg/kg	<0.1-4.4	3.4	8.5
Chrysene	mg/kg	<0.1-5.1	3.9	930
Benzo(b/k)Fluoranthene	mg/kg	<0.1-6.2	4.7	9.9
Benzo(a)pyrene	mg/kg	<0.1-5.3	4.0	1.0
Indeno(123cd)pyrene	mg/kg	<0.1-2.41	1.6	9.7
Dibenz(ah)anthracene	mg/kg	<0.1-1.0	0.7	1.0
Benzo(ghi)perylene	mg/kg	<0.1-2.2	1.7	47

*Values shown in bold indicate concentrations in excess of the Critical Concentration and require more detailed consideration.

6.3.6 Orange grey Clay subsoil

Five samples of this material have been tested, the results of the analysis completed are summarised below

This material was found to have a Total Organic Carbon of between 0.7% and 4.0%, the average value being 2.0, which equates to a Soil Organic Matter (SOM) of 3.4%. The pH of this material was found to be between 6.4 and 7.7 with an average value of 7.1.

Determinand	Units	Range of Concentrations recorded	Upper Confidence Limit	Critical Concentration at 3 % SOM
Arsenic	mg/kg	5-13	12	32
Chromium	mg/kg	15-32	29	3000
Copper	mg/kg	9-27	24	8340
Lead	mg/kg	18-39	37	450
Nickel	mg/kg	18-50	42	130
Zinc	mg/kg	48-270	209	38000

None of the PAH species were detectable within this material.

6.3.7 Gravelly Clay

Two samples of this material have been tested, the results of the analysis completed are summarised below

This material was found to have a Total Organic Carbon of between 1.7% and 2.7%, the average value being 2.2, which equates to a Soil Organic Matter (SOM) of 3.8%. The pH of this material was found to be between 7.4 and 7.5.

Determinand	Units	Range of Concentrations recorded	Critical Concentration at 3 % SOM
Arsenic	mg/kg	7	32
Chromium	mg/kg	13-18	3000
Copper	mg/kg	15-19	8340
Lead	mg/kg	18-31	450
Nickel	mg/kg	23	130
Zinc	mg/kg	96-100	38000

6.3.8 Made Ground Topsoil

Two samples of this material (TP19 and WS4) have been tested, the results of the analysis completed are summarised below

This material was found to have a Total Organic Carbon of between 2.1% and 3.1%, the average value being 2.6, which equates to a Soil Organic Matter (SOM) of 4.5%.

This material was found to have a pH value of 7.4.

Determinand	Units	Range of Concentrations recorded	Critical Concentration at 3 % SOM
Arsenic	mg/kg	6-8	32
Chromium	mg/kg	15-19	3000
Copper	mg/kg	13-18	8340
Lead	mg/kg	29-37	450
Nickel	mg/kg	13-28	130

Determinand	Units	Range of Concentrations recorded	Critical Concentration at 3 % SOM
Zinc	mg/kg	130-150	38000

6.3.9 Made Ground

One sample of Made Ground recovered from TP19 was tested. The material was found to have a soil organic matter content of 2.9 and a pH of 7.7. arsenic, chromium, copper, lead, nickel and zinc were found to be present at concentrations below the adopted assessment criteria values. Benzo(a)pyrene and dibenz(ah)anthracene were recorded within this sample above the adopted assessment criteria values for an SOM of 1%.

6.3.10 Pesticide Suite

Ten samples of near surface (<0.30mbegl) were screened for a suite of pesticides; all samples reported concentrations below the detection limits (<0.01mg/kg).

6.3.11 Total Petroleum Hydrocarbons

In addition to the above five samples were also scheduled for Total Petroleum Hydrocarbon analyses (TPH) all results were below the adopted assessment criteria values.

6.3.12 It should be noted that the classification of soil for waste disposal purposes and any resulting waste acceptance criteria (WAC testing) required under the Landfill Regulations introduced in July 2005 is beyond the scope of this report.

6.4 Geotechnical Testing

6.4.1 Six representative samples of clay were submitted to Scientifics, a UKAS accredited laboratory and the following tests undertaken to determine soil properties as related to foundation design and construction:

- Natural Moisture Content - BS1377; Part 2; 1990
- Plasticity Index Analysis - BS1377; Part 2; 1990

6.4.2 Results of the geotechnical testing are presented in full within Appendix C, and summarised within the table below.

Location	Sample Number	Depth (m)	Plasticity Index (p)	Modified Plasticity Index (p')	Volume Change Potential	Strata
TP8	D20	1.3	19	15	Low	Gravelly CLAY
TP15	D38	1.9	14	11	Low	Gravelly CLAY
TP17	D42	0.9	37	30	Medium	Gravelly CLAY
WS1	D102	2.8	25	24	Medium	Gravelly CLAY
WS3	D107	3.0	13	11	Low	Sandy gravelly CLAY
WS8	D115	0.6	21	17	Low	Sandy gravelly CLAY

- 6.4.2 For the purpose of calculating the effect of trees, in accordance with NHBC Chapter 4.2 the natural clays should be detailed as having a **Medium** volume change potential.

6.5 Ground Gases

- 6.5.1 The site does not require any radon protective measures.

- 6.5.2 The site is currently being monitored for ground gases. To date three visits have been made to the site to measure ground gas and flow rate conditions within the five monitoring installations. The following table summarises the results to date:

Monitoring Point	O ₂ (% v/v)	CO ₂		CH ₄ (total)		CH ₄ (% LEL)		H ₂ S ppm	CO ppm	Flow	
		Peak (% v/v)	Sustained (% v/v)	Peak (% v/v)	Sustained (% v/v)	Peak (%)	Sustained (%)			Peak L/hr	Sustained L/hr
WS1	20.5	0.1	0.1	ND	ND	0.0	0.0	1.0	1.0	0.1	ND
WS3	20.1	0.9	0.9	ND	ND	0.0	0.0	ND	1.0	ND	ND
WS4	20.5	0.1	0.1	ND	ND	0.0	0.0	2.0	0.0	0.8	ND
WS5	20.5	0.4	0.4	ND	ND	0.0	0.0	1.0	0.0	ND	ND

- 6.5.3 To date methane and carbon monoxide have not been detected. Carbon dioxide has been detected up to a maximum concentration of 0.9% v/v. Sustained gas flows have not been recorded with peak flows of up to 0.8l/hr recorded in WS4.
- 6.5.4 Depleted oxygen concentrations were not recorded associated with the carbon dioxide.
- 6.5.5 Monitoring visits have been carried out during periods of rising and falling pressure, with atmospheric pressures of between 1000mb and 1025mb. To date none of the visits have been carried out during a low pressure (<1000mb) or combined low and falling pressure event.

B. ASSESSMENT & RECOMMENDATIONS

7.0 INTRODUCTION

- 7.1 This report has been prepared on the understanding that the site is to be developed with residential properties of traditional 2 and 3 storey construction with associated access roads, landscaped areas, and private gardens. Should the proposed site usage change significantly from the above, the contents of this report will require review and amendment as appropriate.
- 7.2 It is considered that the proposed site use complies with the standard land use “Residential with homegrown produce” and as such generic assessment criteria for that standard land use are appropriate for assessing any chemical contamination. Where required, the soil organic matter content of the specific soil type has been given due consideration in the selection of the assessment criteria.
- 7.2 The ground conditions are typified by the presence of brown, clayey Topsoil underlain by orange grey mottled clay subsoil, underlain by Glacial Till: firm, gravelly Clay. Rock head was not encountered within any of the exploratory holes.

8.0 ENVIRONMENTAL ASSESSMENT

8.1 Soil Contamination Summary and Human Health Risk Assessment

- 8.1.1 The results of the laboratory testing undertaken have been assessed in accordance with the philosophy and tier 1 screening values presented in Appendix D. It is considered that as a conservative tier 1 assessment it is appropriate to adopt screening values for residential with home grown produce. Where assessment criteria were not available from in-house sources or the published SGVs, the LQM/CIEH GACs have been adopted.

The soils encountered on site are divided into four main types:

- Topsoil
- Orange grey Clay subsoil
- Brown grey, gravelly Clay
- Made Ground

- 8.1.2 The full results of the chemical testing are enclosed as Appendix B, however the results are discussed below:

Topsoil

All chemical concentrations within the topsoil with the exception of benzo(a)pyrene were below the adopted assessment criteria values.

Three samples of topsoil, sampled from TP12, WS6 and WS8 all recorded concentrations of benzo(a)pyrene above the assessment criteria values. Trial pit TP12 was situated in the depression formed by the former quarry whilst WS6 and WS8 were drilled in field 5.

With the above exceptions, the topsoil generally across the site is considered to be free from significant contamination which would affect the proposed development and suitable for re-use within any part of the proposed development.

The topsoil in the areas of WS6, WS8 and TP12 is considered suitable for use within areas of public open space or managed landscaped areas at the site without treatment.

Orange grey Clay subsoil

All chemical concentrations within the orange grey Clay fell below the adopted assessment criteria.

In total five samples of this material were tested. This material is considered to present no significant risk to human health and may be reused across site within garden areas.

Brown grey gravelly Clay

All chemical concentrations within the brown grey gravelly Clay fell within the adopted assessment criteria.

Based on the assumption that the two samples of this material which were tested were representative of this material generally, it is considered that this material does not pose a significant potential risk to end users at the site. Based on the available information for the site there is no cause to suspect that this is not the case. This material is therefore considered suitable for re-use on within the development site without treatment.

Made Ground Topsoil

All chemical concentrations within the Made Ground Topsoil were below the adopted assessment criteria.

Based on the assumption that the two samples of this material which were tested were representative of this material generally, it is considered that this material does not pose a significant potential risk to end users at the site. Based on the available information for the site there is no cause to suspect that this is not the case. This material is therefore considered suitable for re-use on within the development site without treatment.

Made Ground

One sample of Made Ground recovered from TP19 was tested and recorded levels of benzo(a)pyrene and dibenz(ah)anthracene above the current Tier 1 in house screening values.

This material should not be retained within 600mm of proposed ground level in garden areas or within 300mm of ground level within landscaped or public open space areas. It could be used to raise levels for landscaping purposes if covered with a minimum of 300mm clean topsoil. The material could also be retained beneath hardstanding.

8.2 Controlled Water Risk Assessment

- 8.2.1 Low permeability soils (i.e. Glacial Till: Clay) were recorded underlying the whole site, therefore the potential for contaminants to leach down into groundwater within the underlying Secondary 'A' (minor) Aquifer is considered to be negligible. Given the generally low concentrations of contaminants detected within the soil it is considered to be a negligible risk of contaminants from the site affecting the groundwater within the minor aquifer.
- 8.2.2 The nearest surface watercourse to the site is the drainage channel which runs between field 3 and 5. Based on the desk study, ground investigation data and the location of soils found to contain slightly elevated contaminant concentrations in relation to the surface watercourse, it is considered that there is a low risk of the low level contaminants migrating laterally from the site to the watercourse.
- 8.2.3 Based on the information available to date it is not considered warranted to undertake detailed investigation of the quality of groundwater within the underlying aquifer at the site at this stage.

8.3 Revised Conceptual Site Model

8.3.1 In light of the site investigation the conceptual site model can be revised to the following:

- Made ground in area to the rear of 'Old Dairy'.
- Contaminated topsoil in field 5
- Contaminated topsoil within the old quarry.

8.4 Recommended Remedial Strategy

8.4.1 Based on the results of the investigation, the Revised Conceptual Site Model and the Risk Assessments, it is considered that the following remediation will be required.

The extent of the made ground located in TP19 should be determined through additional trial pitting. Once the limits of the made ground have been determined the provision of a 600mm thick capping layer will be required where the made ground extends to depths greater than 600mm below proposed ground level. The excavated material can be retained on site and used to raise levels provide there is sufficient room to provide a clean cover of 600mm (gardens) or 300mm in public open space or landscaping areas.

The capping layer should consist of 150mm of topsoil from fields 1 to 4 with the provision of 450mm sub subsoil. The subsoil can also be site derived.

Alternatively, all of this material could be removed from garden areas and re-used in site regrade elsewhere on the site, if required, subject to being afforded the level of cover proposed above.

The topsoil from field 5 and from the former quarry area should be stockpiled separately during the site clearance. This material can then be reused in areas of public open space and soft landscaping. Additional testing should be carried out of the topsoil around the WS6 and WS8 positions to delineate the affected material and allow effective selective excavation, segregation and re-use at an alternative appropriate location on site.

8.5 Health & Safety

8.5.1 During the reclamation and construction phases of the site development it will be necessary to protect the health and safety of site personnel. General guidance on these matters is given in the Health and Safety Executive (HSE) document "Protection of Workers and the General Public during the Redevelopment of Contaminated Land". The guidance is useful whether contamination is present or not.

8.5.2 In summary, the following measures are suggested to provide a minimum level of protection:

- All ground workers should be issued with the relevant protective clothing, footwear and gloves. These protective items should not be removed from the site and personnel should be instructed as to why and how they are to be used.
- Hand-washing and boot-washing facilities should be provided.

- Good practices relating to personal hygiene should be adopted on the site.
- The contractor shall satisfy the Health and Safety Executive with regard to any other matters concerning the health, safety and welfare of persons on the site.

8.6 Waste Disposal

- 8.6.1 Due to the implementation of the Landfill Directive the details of any soils which may require removal from the site should be supplied to the proposed disposal point for clarification on whether a suitable license is held to receive materials with the contamination levels recorded.

8.7 Service Pipes

- 8.7.1 It is unlikely that special precautions to protect water supply mains from soil contaminants will be necessary.

9.0 GEOTECHNICAL ASSESSMENT

9.1 Foundation Design

- 9.1.1 The following recommendations are made assuming that site levels will remain similar to those at present. If this is not the case then the following will require review and possible amendment.
- 9.1.2 Taking into account the Glacial Till: Clay encountered on the site, it is considered that the most economic foundation solution will be unreinforced strip footings, founding within the Glacial Till: Clay at a minimum depth of 900mm below existing or finished ground level, whichever is appropriate in accordance with NHBC Standards 2011.
- 9.1.3 Foundations should be designed based on an allowable bearing capacity of 115kN/m².
- 9.1.4 The results of pH and water soluble sulphate testing for the soils present on site indicate that the site should be classified as having a concrete design sulphate class of DS-1 and ACEC class AC-1, as defined in BRE Special Digest 1 (2005).
- 9.1.5 If areas of fill containing unnatural material are encountered and these are to remain in contact with buried concrete and concrete products, then it would be prudent to adopt a minimum of Class DS2 conditions.

9.2 Floor Slab Design

- 9.2.1 Due to the volume change potential of the underlying Glacial Till: Clay it is considered that suspended ground floors shall be required. Suspended ground floors shall also be required in areas of localised deep made ground, where fill thicknesses exceed 600mm below proposed slab level.
- 9.2.2 Suspended floor slabs with a ventilated sub-floor void may be required if hazardous ground gases associated with the onsite alluvial deposits are shown to affect the site. Currently available information suggests that it is unlikely that gas protection measures will be required. Confirmation of this shall be provided once the full programme of monitoring has been completed and the gas risk assessment for the site carried out. This will be reported under separate cover upon completion.
- 9.2.3 **No** radon gas protection measures are required, and no other potential sources of hazardous ground gases have been identified in the environs of the site.

9.3 Building Near Trees

- 9.3.1 In accordance with industry best practice, NHBC Standards Chapter 4.2, the near surface natural soils have been classed as **Medium** change potential and therefore deepening due to existing or proposed trees shall require consideration where foundations are founded within clay.

9.3.2 The extent of deepening due to existing trees shall be limited to the periphery of the site due to the existing surrounding hedges and mature trees.

9.3.2 Heave precautions will be required in accordance with NHBC Standards Chapter 4.2, where foundation depths exceed 1.50m as a result of deepening due to the effects of trees.

9.4 Pavement Design

9.4.1 Six plate load CBR tests were undertaken on the natural clays, it is considered that a CBR value of 1-2% will be suitable for the underlying Glacial Till: Clay.

9.5 Construction

9.5.1 No groundwater seepages were observed during excavation of the exploratory holes. It is therefore considered that groundwater shall not be an issue during construction.

9.5.2 No side stability issues were encountered within the Glacial Till: Clay, however large cobbles and boulders were encountered which may affect traditional excavations.

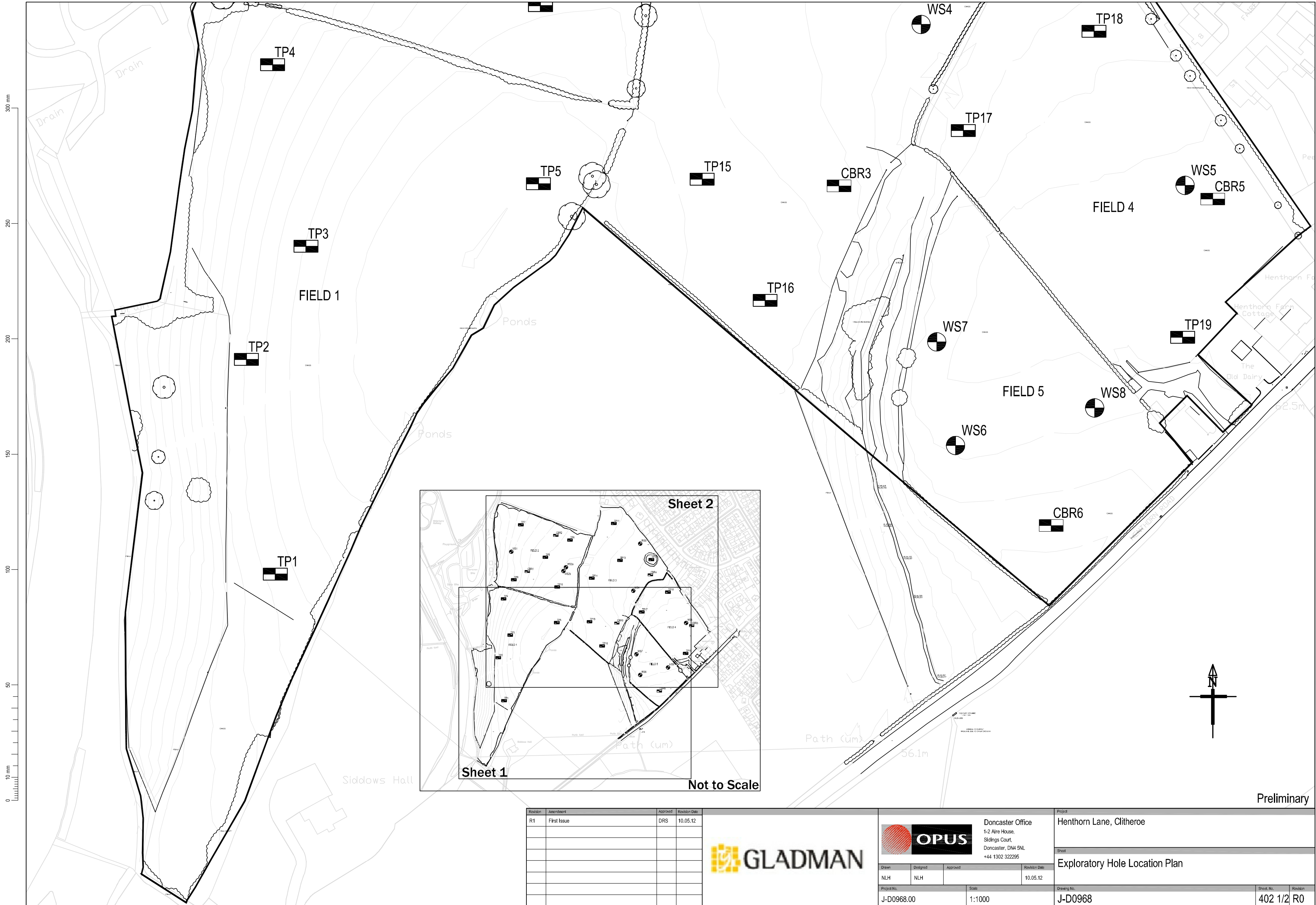
9.6 Soakaways/Drainage

9.6.1 Due to the underlying Glacial Till: Clay strata it is considered soakaways shall be an unsuitable method of surface water drainage for this site, an alternative method should be sought.

10.0 FURTHER WORKS

- 10.1 The following further works have been recommended prior to the development of the site:
- (a) Completion of the gas monitoring.
 - (b) Further trial pits to the rear of the 'Old Dairy' in order to delineate the area of made ground.
 - (c) Delineation of PAH contaminated topsoil in Field 5;
 - (d) Preparation of Remediation Strategy (if required); and
 - (e) Validation of capping layer, if required.

DRAWINGS



Revision	Amendment	Approved	Revision Date
R1	First Issue	DRS	10.05.12

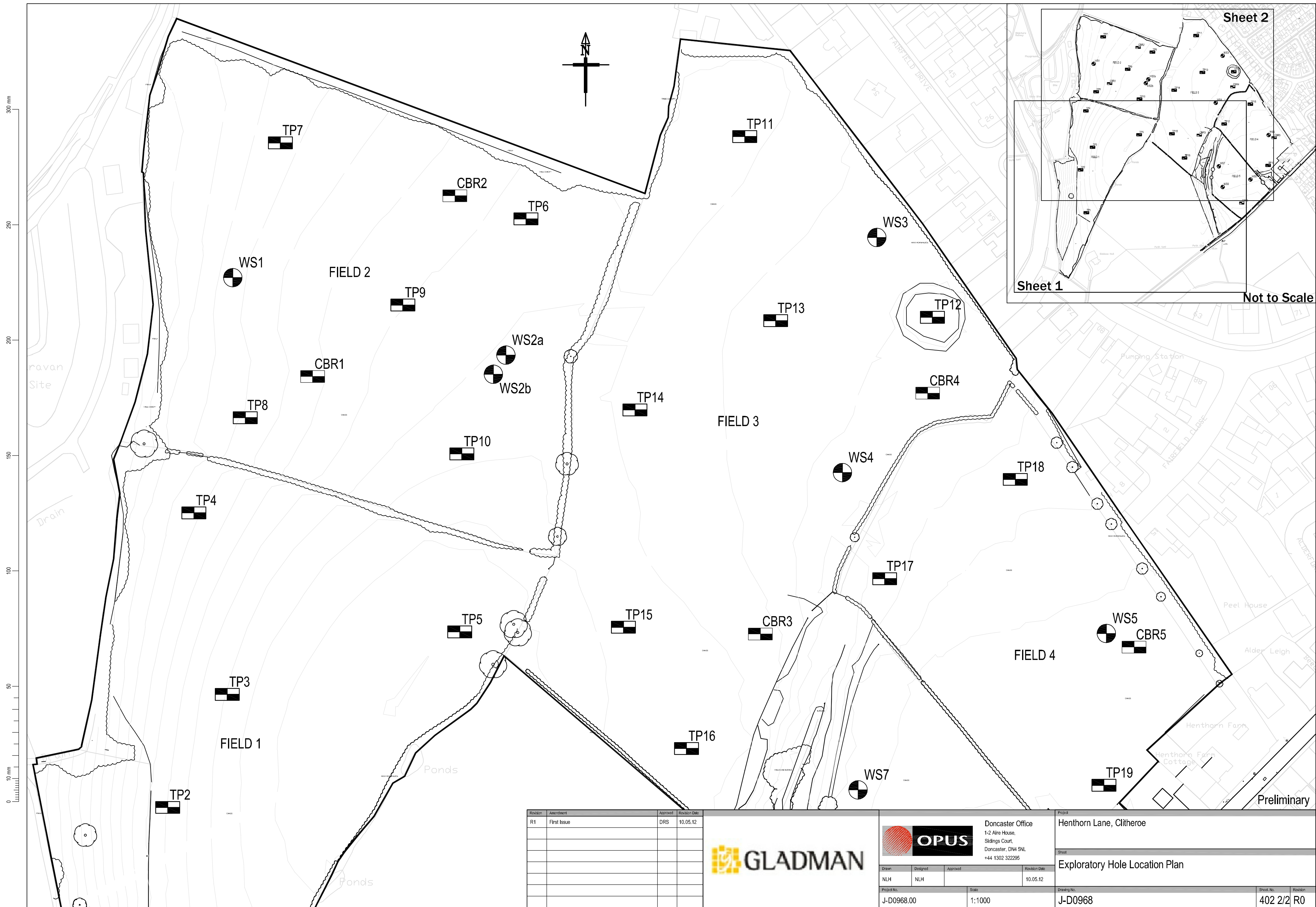


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Drawn	Designed	Approved	Revision Date
NLH	NLH		10.05.12

Project No.	Scale
J-D0968.00	1:1000

Project	
Henthorn Lane, Clitheroe	
Sheet	
Exploratory Hole Location Plan	
Drawing No.	Sheet No. / Revision
J-D0968	402 1/2 R0

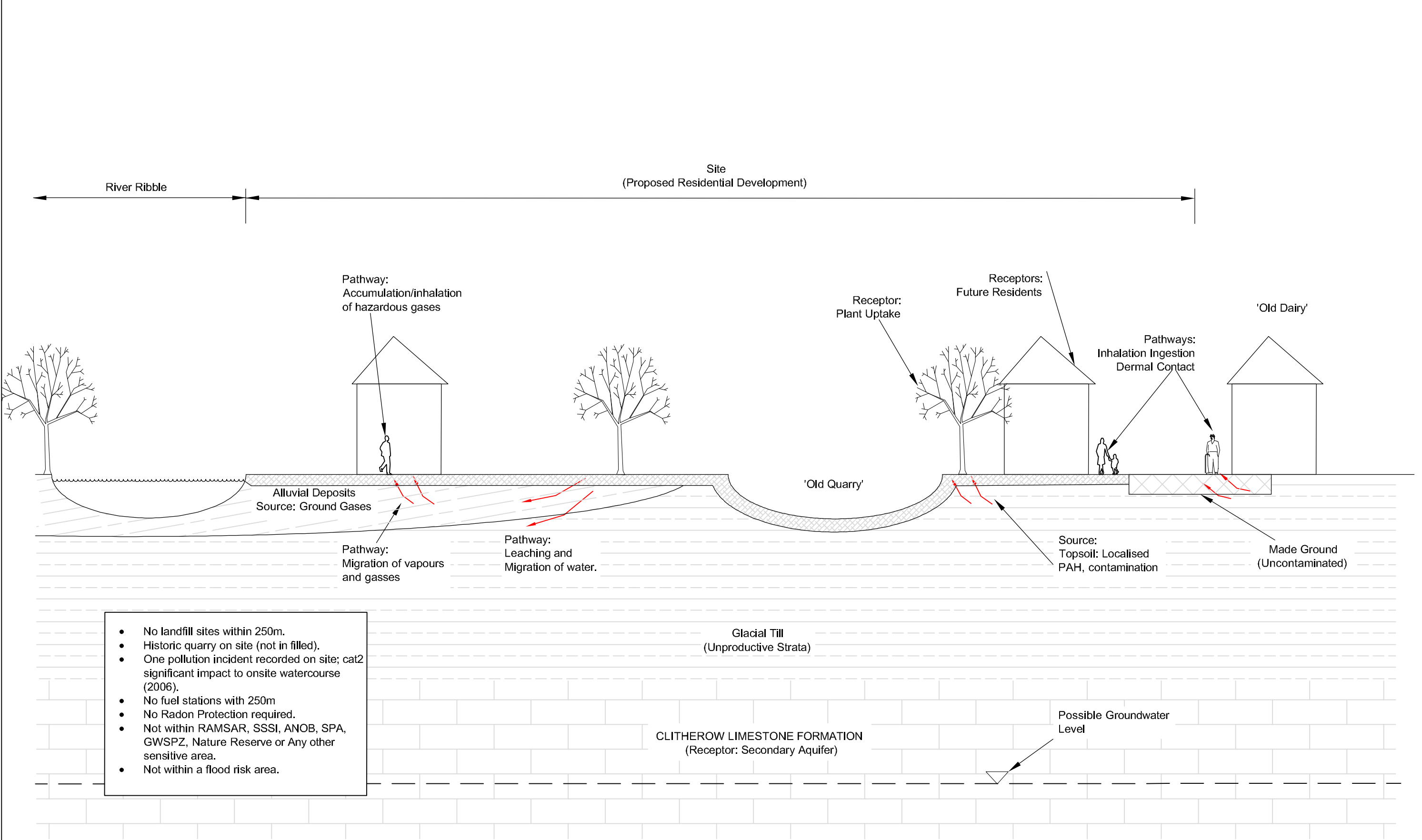


Revision	Assessment	Approved	Revision Date
R1	First Issue	DRS	10.05.12

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Drawn	Designed	Approved	Revision Date
NLH	NLH		10.05.12
Project No.	Scale		
J-D0968.00	1:1000		

Project	Henthorn Lane, Clitheroe		
Sheet	Exploratory Hole Location Plan		
Drawing No.		Sheet No.	Revision
J-D0968		402 2/2	R0



FOR INFORMATION

Revision	Amendment	Approved	Revision Date
R0	First Issue	SLR	May, 2012



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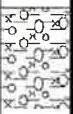
Drawn	Designed	Approved	Revision Date
STM	STM	SLR	28.05.12

Project No.	Scale
J-D0968.00	NTS

Project		
Henthorne Lane Clithrow		
Sheet		
Conceptual Site Model		
Drawing No.	Sheet No.	Revision
DO J-D0968.00	403	R0

APPENDIX A

Exploratory Hole Logs

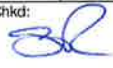
Exploratory Hole ID: CBR1	Client: Gladman Developments Limited		 www.opusinternational.co.uk					
Job No: J_D0968	Site: Henthorn Lane, Clitheroe							
Drilling Equipment/ Excavation Method: Mechanical Backhoe Excavator.		Co-ords: 372822E - 441110N	Start Date: 04/05/2012	End Date: 04/05/2012				
		Ground Level (mAOD): 59.700	Backfill Date: 04/05/2012	Field Records: NLH2012/02				
			Logged: NLH	Chkd:  Appr: 				
Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
TOPSOIL. Firm consistency, orange brown grey mottled, slightly friable, gravelly CLAY. Gravel is fine to coarse with occasional cobbles. Gravel and cobbles are subangular to subrounded, mixed lithology. [GLACIAL TILL]. End of Exploratory Hole at 0.70 m	0.30 0.70	59.40 59.00						
Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.					Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample		Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading	
					Sheet: Sheet 1 of 1			

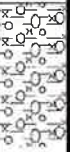
Exploratory Hole ID:	Client: Gladman Developments Limited					 www.opusinternational.co.uk						
CBR2	Site: Henthorn Lane, Clitheroe											
Job No:	J_D0968					Start Date:		End Date:				
					04/05/2012		04/05/2012					
Drilling Equipment/ Excavation Method: Mechanical Backhoe Excavator.					Co-ords:		Backfill Date:		Field Records:			
					372884E - 441188N		04/05/2012		NLH2012/02			
					Ground Level (mAOD):		Logged:		Chkd: 			
					60.500		NLH		Appr: 			
Strata Description					Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
TOPSOIL.					0.20	60.30						
Firm consistency, orange brown mottled, slightly friable, gravelly CLAY. Gravel is fine to coarse with occasional cobbles. Gravel and cobbles are subangular to subrounded, mixed lithology. [GLACIAL TILL].					0.35	60.15						
----- End of Exploratory Hole at 0.35 m												
Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.					Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample				Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading			
					Sheet: Sheet 1 of 1							

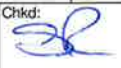
Exploratory Hole ID: CBR3	Client: Gladman Developments Limited Site: Henthorn Lane, Clitheroe	 www.opusinternational.co.uk						
Job No: J_D0968		Start Date: 04/05/2012 End Date: 04/05/2012						
Drilling Equipment/ Excavation Method: Mechanical Backhoe Excavator.		Co-ords: 373016E - 440998N Backfill Date: 04/05/2012 Field Records: NLH2012/02						
		Ground Level (mAOD): 61.400 Logged: NLH Chkd:  Appr: 						
Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
TOPSOIL.	0.20	61.20						
Firm to stiff consistency, brown grey, friable CLAY. [GLACIAL TILL].	0.35	61.05						
End of Exploratory Hole at 0.35 m								
Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.						Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample		Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading
						Sheet: Sheet 1 of 1		

Exploratory Hole ID: CBR4	Client: Gladman Developments Limited					 www.opusinternational.co.uk		
Job No: J_D0968	Site: Henthorn Lane, Clitheroe					Start Date: 04/05/2012		End Date: 04/05/2012
Drilling Equipment/ Excavation Method: Mechanical Backhoe Excavator.		Co-ords: 373089E - 441102N			Backfill Date: 04/05/2012		Field Records: NLH2012/02	
		Ground Level (mAOD): 59.500			Logged: NLH	Chkd: 	Appr: 	
Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: Brown red, friable, clayey, gravelly topsoil. Gravel is fine to coarse with occasional brick and cobble fragments. [FILL].	0.50	59.00		DD201	0.25			
MADE GROUND: Firm consistency, brown grey mottled, gravelly clay. Gravel is fine to coarse. [FILL].	0.65	58.85		DD202	0.65			
End of Exploratory Hole at 0.65 m								
Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.					Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample		Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading	
					Sheet: Sheet 1 of 1			

Exploratory Hole ID: CBR5	Client: Gladman Developments Limited		 www.opusinternational.co.uk					
Job No: J_D0968	Site: Henthorn Lane, Clitheroe							
Drilling Equipment/ Excavation Method: Mechanical Backhoe Excavator.		Co-ords: 373178E - 440992N	Start Date: 04/05/2012	End Date: 04/05/2012				
		Ground Level (mAOD): 62.200	Backfill Date: 04/05/2012	Field Records: NLH2012/02				
		Logged: NLH	Chkd: 	Appr: 				
Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: Brown red, friable, clayey, gravelly topsoil. Gravel is fine to coarse with occasional brick and cobble fragments. [FILL].	0.30 0.35	61.90 61.85						
MADE GROUND: Firm consistency, orange brown mottled, gravelly clay. Gravel is fine to coarse. [FILL].								
End of Exploratory Hole at 0.35 m								
Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.						Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample	Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading	
						Sheet: Sheet 1 of 1		

Exploratory Hole ID: CBR6	Client: Gladman Developments Limited		 www.opusinternational.co.uk					
Job No: J_D0968	Site: Henthorn Lane, Clitheroe							
Drilling Equipment/ Excavation Method: Mechanical Backhoe Excavator.		Co-ords: 373108E - 440851N	Start Date: 04/05/2012	End Date: 04/05/2012				
		Ground Level (mAOD): 59.500	Backfill Date: 04/05/2012	Field Records: NLH2012/02				
		Logged: NLH	Chkd: 	Appr: 				
Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: Brown red, friable, clayey, gravelly topsoil. Gravel is fine to coarse with occasional brick and cobble fragments. [FILL].	0.30	59.20						
MADE GROUND: Firm consistency, orange brown mottled, gravelly clay. Gravel is fine to coarse. [FILL].	0.35	59.15						
End of Exploratory Hole at 0.35 m								
Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.						Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample	Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading	
						Sheet: Sheet 1 of 1		

Exploratory Hole ID: TP1	Client: Gladman Developments Limited		 www.opusinternational.co.uk					
Job No: J_D0968	Site: Henthorn Lane, Clitheroe							
Drilling Equipment/ Excavation Method: Mechanical Backhoe Excavator.		Co-ords: 372772E - 440830N	Start Date: 02/05/2012	End Date: 02/05/2012				
		Ground Level (mAOD): 60.400	Backfill Date: 02/05/2012	Field Records: NLH2012/01				
		Logged: NLH	Chkd: 	Appr: 				
Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
Brown, clayey TOPSOIL with rootlets.	0.30	60.10		DD1	0.15	V = 55 kPa		
Firm to stiff consistency, orange brown mottled, gravelly CLAY. Gravel is of fine to coarse, subangular to subrounded mixed lithology. [GLACIAL TILL].	0.80	59.60		DD2	0.50			
Firm to stiff consistency, grey brown, gravelly CLAY. Occasional boulders [GLACIAL TILL].	1.00	59.40						
End of Exploratory Hole at 1.00 m								
Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.						Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample		Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading
						Sheet: Sheet 1 of 1		

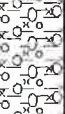
Exploratory Hole ID: TP2	Client: Gladman Developments Limited		 www.opusinternational.co.uk	
Job No: J_D0968	Site: Henthorn Lane, Clitheroe			
Drilling Equipment/ Excavation Method: Mechanical Backhoe Excavator,		Co-ords: 372759E - 440923N	Start Date: 02/05/2012	End Date: 02/05/2012
		Ground Level (mAOD): 60.000	Backfill Date: 02/05/2012	Field Records: NLH2012/01
		Logged: NLH	Chkd: 	Appr: 

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
Brown soft clayey TOPSOIL.	0.30	59.70		DD3	0.10			
Firm consistency, grey brown mottled, gravelly CLAY. Gravel is of fine to coarse, subangular to subrounded mixed lithology. [GLACIAL TILL].	0.80	59.20		DD4	0.70			
Firm consistency, orange brown mottled, gravelly CLAY. Gravel is of fine to coarse, subangular to subrounded mixed lithology with quartz boulders. [GLACIAL TILL].	0.90	59.10						
End of Exploratory Hole at 0.90 m								

Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.	Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample	Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading
	Sheet: Sheet 1 of 1	

Exploratory Hole ID:	Client: Gladman Developments Limited					 www.opusinternational.co.uk						
TP3	Site: Henthorn Lane, Clitheroe											
Job No:	J_D0968					Start Date:		End Date:				
					02/05/2012		02/05/2012					
Drilling Equipment/ Excavation Method: Mechanical Backhoe Excavator.					Co-ords:		Backfill Date:		Field Records:			
					372785E - 440972N		02/05/2012		NLH2012/01			
					Ground Level (mAOD):		Logged:		Chkd: Appr:			
					62.100		NLH		 			
Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details				
Brown soft clayey TOPSOIL with rootlets.	0.30	61.80		DD5	0.15	V= 60 kPa						
Soft to firm consistency, grey brown orange mottled, gravelly CLAY. Gravel is of fine to coarse, subangular to subrounded mixed lithology. Boulders of quartz from 0.80m. [GLACIAL TILL].				DD6	0.80							
End of Exploratory Hole at 1.10 m	1.10	61.00										
Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.					Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample				Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading			
					Sheet:							
					Sheet 1 of 1							

Exploratory Hole ID:	Client: Gladman Developments Limited					 www.opusinternational.co.uk				
TP4	Site: Henthorn Lane, Clitheroe									
Job No:	J_D0968					Start Date:		End Date:		
					02/05/2012		02/05/2012			
Drilling Equipment/ Excavation Method: Mechanical Backhoe Excavator.					Co-ords:		Backfill Date:		Field Records:	
					372771E - 441050N		02/05/2012		NLH2012/01	
					Ground Level (mAOD):		Logged:		Chkd: Appr:	
					57.800		NLH		 	

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
Brown soft clayey TOPSOIL with rootlets.	0.30	57.50		DD7	0.10	V= 45 kPa		
Soft to firm consistency, orange brown mottled, gravelly CLAY. Gravel is of fine to coarse, subangular to subrounded mixed lithology. Boulders of quartz from 0.80m. [GLACIAL TILL].	0.85	56.95		DD8	0.50			
----- End of Exploratory Hole at 0.85 m								

Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.	Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample	Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading
Sheet: Sheet 1 of 1		

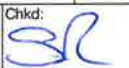
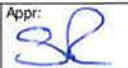
Exploratory Hole ID:	Client: Gladman Developments Limited					 www.opusinternational.co.uk				
TP5	Site: Henthorn Lane, Clitheroe									
Job No:	J_D0968					Start Date:		End Date:		
					02/05/2012		02/05/2012			
Drilling Equipment/ Excavation Method: Mechanical Backhoe Excavator.					Co-ords:		Backfill Date:		Field Records:	
					372886E - 440999N		02/05/2012		NLH2012/01	
					Ground Level (mAOD):		Logged:		Chkd: Appr:	
					64.600		NLH		 	
Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details		
Brown soft clayey TOPSOIL with rootlets.	0.30	64.30		DD9	0.10	V= 60 kPa				
Soft to firm consistency, orange brown grey mottled, gravelly CLAY. Gravel is of subangular to subrounded, slightly friable, mixed lithology. Increasing quartz boulders and cobbles at 0.85m. [GLACIAL TILL].	0.90	63.70		DD10	0.75					
End of Exploratory Hole at 0.90 m										
Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.						Sample Type Key		Test Type Key		
						D - Disturbed Representative		(C) - Cone SPT		
						B - Bulk Representative		(S) - Spoon SPT		
S - Spot Non-Representative		P - Pocket Penetrometer Reading								
W - Water		PID - PID Reading								
U - Undisturbed Representative		V - Hand Shear Vane Reading								
J - Jar Sample										
Sheet:						Sheet 1 of 1				

Exploratory Hole ID:	Client: Gladman Developments Limited					 www.opusinternational.co.uk				
TP6	Site: Henthorn Lane, Clitheroe									
Job No:	J_D0968					Start Date:		End Date:		
					02/05/2012		02/05/2012			
Drilling Equipment/ Excavation Method: Mechanical Backhoe Excavator.					Co-ords:		Backfill Date:		Field Records:	
					372915E - 441178N		02/05/2012		NLH2012/01	
					Ground Level (mAOD):		Logged:		Chkd: Appr:	
					61.200		NLH		 	

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
Brown soft clayey TOPSOIL with rootlets.	0.30	60.90		DD11	0.15	V= 46 kPa		
Soft to firm consistency, orange brown grey mottled, slightly gravelly CLAY. Gravel is of fine to coarse, poorly sorted mixed litholgy with occasional boulders and cobbles. [GLACIAL TILL].	0.85	60.35		DD12	0.60			
Firm consistency, brown grey mottled, gravelly CLAY. Gravel is of fine to coarse, friable, poorly sorted mixed litholgy with occasional boulders and cobbles. [GLACIAL TILL].	1.70	59.50		DD13	1.10			
Firm consistency, dark brown, dark grey, gravelly CLAY. Gravel is of sandstone and quartz cobbles and boulders. [GLACIAL TILL].	1.90	59.30						
End of Exploratory Hole at 1.90 m								

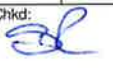
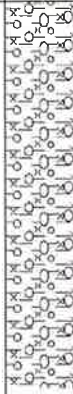
Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.	Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample	Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading
Sheet: Sheet 1 of 1		

Exploratory Hole ID: TP7	Client: Gladman Developments Limited		 www.opusinternational.co.uk					
Job No: J_D0968	Site: Henthorn Lane, Clitheroe							
Drilling Equipment/ Excavation Method: Mechanical Backhoe Excavator.		Co-ords: 372808E - 441211N	Start Date: 02/05/2012	End Date: 02/05/2012				
		Ground Level (mAOD): 57.600	Backfill Date: 02/05/2012	Field Records: NLH2012/01				
		Logged: NLH	Chkd: 	Appr: 				
Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
Brown soft clayey TOPSOIL with rootlets. [FILL].	0.30	57.30		DD14	0.10	V= 42 kPa		
Soft to firm consistency, orange brown grey mottled, slightly gravelly CLAY. Gravel is of fine to coarse, poorly sorted mixed litholgy with occasional boulders and cobbles. [GLACIAL TILL].	0.75	56.85		DD15	0.60			
Soft to firm consistency, dark grey brown mottled, gravelly CLAY. [GLACIAL TILL].				DD16	1.30			
				DD17	2.30			
Firm consistency, brown CLAY. [GLACIAL TILL].	2.90	54.70		DD18	3.30	V= 96 kPa		
End of Exploratory Hole at 3.85 m	3.85	53.75						
Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.						Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample		Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading
Sheet:						Sheet 1 of 1		

Exploratory Hole ID: TP8	Client: Gladman Developments Limited		 www.opusinternational.co.uk	
Job No: J_D0968	Site: Henthorn Lane, Clitheroe			
Drilling Equipment/ Excavation Method: Mechanical Backhoe Excavator.		Co-ords: 372793E - 441092N	Start Date: 02/05/2012	End Date: 02/05/2012
		Ground Level (mAOD): 58.200	Backfill Date: 02/05/2012	Field Records: NLH2012/01
		Logged: NLH	Chkd: 	Appr: 

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
Brown soft clayey TOPSOIL with rootlets.	0.30	57.90		DD19	0.15	V= 57 kPa		
Soft to firm consistency, orange brown, slightly gravelly CLAY. Gravel is of fine to coarse, poorly sorted mixed lithology with occasional boulders and cobbles. [GLACIAL TILL].	0.75	57.45		DD20	1.30			
Firm to stiff consistency, orange brown grey, gravelly CLAY. Gravel is of fine to coarse, subangular to subrounded mudstone and quartz. [GLACIAL TILL].	1.70	56.50		DD21	1.90			
Firm to stiff consistency, dark grey, gravelly CLAY. Gravel is of fine to coarse, subangular to subrounded, poorly sorted mixed lithology with occasional cobbles and boulders. [GLACIAL TILL].	2.30	55.90						
End of Exploratory Hole at 2.50 m								

Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.	Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample	Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading
	Sheet: Sheet 1 of 1	

Exploratory Hole ID: TP9	Client: Gladman Developments Limited		 www.opusinternational.co.uk						
Job No: J_D0968	Site: Henthorn Lane, Clitheroe								
Drilling Equipment/ Excavation Method: Mechanical Backhoe Excavator.		Co-ords: 372861E - 441141N	Start Date: 02/05/2012	End Date: 02/05/2012					
		Ground Level (mAOD): 61.000	Backfill Date: 02/05/2012	Field Records: NLH2012/01					
		Logged: NLH	Chkd: 	Appr: 					
Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details	
Brown soft clayey TOPSOIL with rootlets.	0.30	60.70		DD22	1.35	V = 54 kPa			
Soft to firm consistency, orange brown mottled, gravelly CLAY. Gravel is of fine to coarse, poorly sorted mixed litholgy with occasional boulders and cobbles. [GLACIAL TILL].	0.80	60.20							
Firm consistency, dark brown orange grey mottled, gravelly CLAY. Gravel is of fine to coarse, subangular to subrounded, mudstone and quartz. Occasional cobbles of mudstone and sandstone, becoming friable and more frequent with depth. [GLACIAL TILL].									
End of Exploratory Hole at 2.70 m	2.70	58.30							
Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.						Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample		Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penitrometer Reading PID - PID Reading V - Hand Shear Vane Reading	
Sheet:						Sheet 1 of 1			

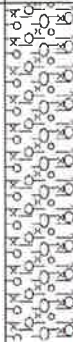
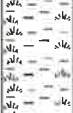
Exploratory Hole ID: TP10	Client: Gladman Developments Limited		 www.opusinternational.co.uk					
Job No: J_D0968	Site: Henthorn Lane, Clitheroe							
Drilling Equipment/ Excavation Method: Mechanical Backhoe Excavator.		Co-ords: 372887E - 441076N	Start Date: 02/05/2012	End Date: 02/05/2012				
		Ground Level (mAOD): 62.800	Backfill Date: 02/05/2012	Field Records: NLH2012/01				
		Logged: NLH	Chkd: 	Appr: 				
Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
Brown soft clayey TOPSOIL with rootlets.	0.30	62.50		DD23 DD24 DD25	0.75 1.30 2.05	V= 48 kPa		
Firm consistency, orange brown, gravelly CLAY. Gravel is of fine to coarse, poorly sorted mixed litholgy with occasional boulders and cobbles. [GLACIAL TILL].	0.85	61.95						
Soft to firm consistency, orange brown mottled, gravelly CLAY. Gravel is of fine to coarse, poorly sorted mixed litholgy with occasional boulders and cobbles. [GLACIAL TILL].	1.80	61.00						
Stiff consistency, dark grey, gravelly CLAY. Gravel is of fine to coarse, subangular to subrounded, poorly sorted mixed lithology with occasional cobbles and boulders. [GLACIAL TILL].	2.40	60.40						
End of Exploratory Hole at 2.40 m								
Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.						Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample	Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading	
						Sheet: Sheet 1 of 1		

Exploratory Hole ID: TP11	Client: Gladman Developments Limited		 www.opusinternational.co.uk						
Job No: J_D0968	Site: Henthorn Lane, Clitheroe								
Drilling Equipment/ Excavation Method: Mechanical Backhoe Excavator.		Co-ords: 373010E - 441214N	Start Date: 03/05/2012	End Date: 03/05/2012					
		Ground Level (mAOD): 62.200	Backfill Date: 03/05/2012	Field Records: NLH2012/01					
			Logged: NLH	Chkd:  Appr: 					
Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details	
Brown soft clayey TOPSOIL with rootlets.	0.30	61.90		DD26	0.10	V = 115 kPa			
Firm consistency, orange brown grey mottled, gravelly CLAY. Gravel is of fine to coarse, subangular to subrounded, quartz, mudstone and limestone with occasional cobbles. [GLACIAL TILL].	0.90	61.30		DD27	0.80				
Firm to stiff consistency, dark grey brown, very gravelly CLAY. Gravel is of fine to coarse, subangular to subrounded, poorly sorted, mixed lithology. Occasional cobbles and boulders of mixed lithology. [GLACIAL TILL].				DD28	1.50				
End of Exploratory Hole at 2.70 m	2.70	59.50							
Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.						Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample		Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading	
Sheet:						Sheet 1 of 1			

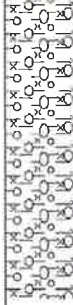
Exploratory Hole ID: TP12	Client: Gladman Developments Limited		 www.opusinternational.co.uk	
Job No: J_D0968	Site: Henthorn Lane, Clitheroe			
Drilling Equipment/ Excavation Method: Mechanical Backhoe Excavator.		Co-ords: 373091E - 441135N	Start Date: 03/05/2012	End Date: 03/05/2012
		Ground Level (mAOD): 58.500	Backfill Date: 03/05/2012	Field Records: NLH2012/01
		Logged: NLH	Chkd: 	Appr: 

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
Brown soft clayey TOPSOIL with rootlets.	0.30	58.20		DD29	0.10	V= 70 kPa V= 120 kPa		
Firm to stiff consistency, dark brown, dark grey CLAY with rare rootlets. [GLACIAL TILL].	0.80	57.70		DD30 DD31	0.70 0.95			
Firm to stiff consistency, dark grey brown, friable gravelly CLAY. Gravel is of fine to coarse, subangular to subrounded, poorly sorted with occasional cobbles and boulders of limestone, mudstone and quartz. [GLACIAL TILL].								
				DD32	2.70			
				DD33	4.00			
End of Exploratory Hole at 4.10 m	4.10	54.40						

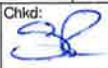
Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.	Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample	Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading
	Sheet: Sheet 1 of 1	

Exploratory Hole ID: TP13	Client: Gladman Developments Limited		 www.opusinternational.co.uk					
Job No: J_D0968	Site: Henthorn Lane, Clitheroe							
Drilling Equipment/ Excavation Method: Mechanical Backhoe Excavator.		Co-ords: 373023E - 441134N	Start Date: 03/05/2012	End Date: 03/05/2012				
		Ground Level (mAOD): 60.700	Backfill Date: 03/05/2012	Field Records: NLH2012/01				
		Logged: NLH	Chkd: 	Appr: 				
Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
Brown soft clayey TOPSOIL with rootlets.	0.30	60.40		DD34	0.75	V= 68 kPa		
Soft to firm consistency, brown orange grey mottled, silty CLAY. Very rare fine grained, grey sand lense noted. [GLACIAL TILL].								
Firm consistency, dark grey brown, slightly gravelly CLAY. Gravel is fine to medium, subangular to subrounded, poorly sorted mudstone and limestone. Occasional coarse cobbles. [GLACIAL TILL].	1.20 1.40	59.50 59.30						
Firm consistency, dark grey brown, very gravelly CLAY. Gravel is of fine to coarse, subangular to subrounded, poorly sorted mudstone and limestone. [GLACIAL TILL].	2.35	58.35						
End of Exploratory Hole at 2.35 m								
Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.					Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample		Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading	
					Sheet: Sheet 1 of 1			

Exploratory Hole ID:	Client: Gladman Developments Limited					 www.opusinternational.co.uk				
TP14	Site: Henthorn Lane, Clitheroe									
Job No:	J_D0968					Start Date:		End Date:		
					03/05/2012		03/05/2012			
Drilling Equipment/ Excavation Method: Mechanical Backhoe Excavator.					Co-ords:		Backfill Date:		Field Records:	
					372962E - 441095N		03/05/2012		NLH2012/01	
					Ground Level (mAOD):		Logged:	Chkd:	Appr:	
					61.800		NLH	sl	sl	

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
Brown soft clayey TOPSOIL with rootlets.	0.30	61.50		DD35	1.00	V = 55 kPa		
Soft to firm consistency, orange brown, slightly gravelly CLAY. Gravel is fine to medium, subangular to subrounded, poorly sorted mudstone and limestone. [GLACIAL TILL].	0.90	60.90						
Firm to stiff consistency, brown grey, gravelly CLAY. Gravel is of fine to coarse, subangular to subrounded, poorly sorted with occasional cobbles and boulders of limestone, mudstone and quartz. [GLACIAL TILL].	1.50	60.30						
Firm consistency, brown grey, gravelly CLAY. Gravel is of fine to coarse, subangular to subrounded, poorly sorted mudstone and limestone. Boulders increase with depth. [GLACIAL TILL].	2.10	59.70						
End of Exploratory Hole at 2.10 m								

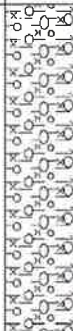
Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.	Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample	Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading
	Sheet: Sheet 1 of 1	

Exploratory Hole ID: TP15	Client: Gladman Developments Limited Site: Henthorn Lane, Clitheroe	 www.opusinternational.co.uk	
Job No: J_D0968		Start Date: 03/05/2012	End Date: 03/05/2012
Drilling Equipment/ Excavation Method: Mechanical Backhoe Excavator.	Co-ords: 372957E - 441001N	Backfill Date: 03/05/2012	Field Records: NLH2012/01
	Ground Level (mAOD): 62.700	Logged: NLH	Chkd:  Appr: 

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
Brown soft clayey TOPSOIL with rootlets.	0.30	62.40		DD36	0.15	V= 120 kPa		
Soft to firm consistency, orange brown grey, gravelly CLAY. Gravel is of fine to coarse, subangular to subrounded, poorly sorted mudstone and limestone. Increased gravel with depth. [GLACIAL TILL].	0.75	61.95		DD37	0.70			
Soft to firm consistency, brown grey orange mottled, very gravelly CLAY. Gravel is coarse, subangular to subrounded, poorly sorted mudstone and limestone. [GLACIAL TILL].	1.70	61.00		DD38	1.90			
Firm consistency, dark grey, very gravelly CLAY. Gravel is coarse, subangular to subrounded, poorly sorted mudstone and limestone. Boulders become more frequent with depth. [GLACIAL TILL].	2.65	60.05						
End of Exploratory Hole at 2.65 m								

Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.	Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample	Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading
Sheet: Sheet 1 of 1		

Exploratory Hole ID: TP16	Client: Gladman Developments Limited					 www.opusinternational.co.uk		
Job No: J_D0968	Site: Henthorn Lane, Clitheroe							
Drilling Equipment/ Excavation Method: Mechanical Backhoe Excavator.		Co-ords: 372984E - 440948N		Backfill Date: 03/05/2012		Field Records: NLH2012/01		
		Ground Level (mAOD): 62.400		Logged: NLH		Chkd: 		Appr: 
Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
Brown soft clayey TOPSOIL with rootlets.	0.30	62.10		DD39	0.45			
Soft to firm consistency, dark grey brown, gravelly CLAY. Gravel is of fine to coarse, subangular to subrounded, poorly sorted mudstone and limestone. [GLACIAL TILL].	0.80	61.60		DD40	1.80			
Soft to firm, dark grey brown, friable, very gravelly CLAY. Gravel is of fine to coarse, subangular to subrounded, poorly sorted mudstone and limestone. [GLACIAL TILL].								
End of Exploratory Hole at 2.65 m	2.65	59.75						
Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.						Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample		Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading
						Sheet: Sheet 1 of 1		

Exploratory Hole ID: TP17	Client: Gladman Developments Limited					 www.opusinternational.co.uk		
Job No: J_D0968	Site: Henthorn Lane, Clitheroe					Start Date: 03/05/2012		End Date: 03/05/2012
Drilling Equipment/ Excavation Method: Mechanical Backhoe Excavator.			Co-ords: 373070E - 441022N		Backfill Date: 03/05/2012		Field Records: NLH2012/01	
			Ground Level (mAOD): 59.500		Logged: NLH	Chkd: 	Appr: 	
Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
Brown soft clayey TOPSOIL with rootlets.	0.30	59.20		DD41	0.20	V= 120 kPa		
Firm to stiff consistency, dark brown grey, gravelly CLAY. Gravel is of fine to coarse, subangular to subrounded, poorly sorted mixed lithology. [GLACIAL TILL].				DD42	0.90			
End of Exploratory Hole at 2.30 m	2.30	57.20						
Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.					Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample		Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading	
					Sheet: Sheet 1 of 1			

Exploratory Hole ID: TP18	Client: Gladman Developments Limited		 www.opusinternational.co.uk					
Job No: J_D0968	Site: Henthorn Lane, Clitheroe							
Drilling Equipment/ Excavation Method: Mechanical Backhoe Excavator.		Co-ords: 373127E - 441065N	Start Date: 03/05/2012	End Date: 03/05/2012				
		Ground Level (mAOD): 60.400	Backfill Date: 03/05/2012	Field Records: NLH2012/01				
		Logged: NLH	Chkd: 	Appr: 				
Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
Brown soft clayey TOPSOIL with rootlets.	0.30	60.10		DD43	0.70	V= 66 kPa V= 96 kPa		
Firm consistency, grey brown silty CLAY. Becoming friable with depth. [GLACIAL TILL].	1.20	59.20		DD44	2.20			
Soft to firm consistency, grey brown, silty, slightly gravelly CLAY. Gravel is of subangular to subrounded mixed lithology. Occasional cobbles of mudstone and limestone with increasing depth. [GLACIAL TILL].	2.45	57.95						
End of Exploratory Hole at 2.45 m								
Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.						Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample	Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading	
						Sheet: Sheet 1 of 1		

Exploratory Hole ID: TP19	Client: Gladman Developments Limited					 www.opusinternational.co.uk		
Job No: J_D0968	Site: Henthorn Lane, Clitheroe					Start Date: 03/05/2012		End Date: 03/05/2012
Drilling Equipment/ Excavation Method: Mechanical Backhoe Excavator.		Co-ords: 373165E - 440932N		Backfill Date: 03/05/2012		Field Records: NLH2012/01		
		Ground Level (mAOD): 62.200		Logged: NLH		Chkd: 	Appr: 	
Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: Firm to stiff consistency, brown orange mottled, clayey topsoil with rootlets and occasional gravel. [FILL].	0.30	61.90		DD45	0.10			
MADE GROUND: Friable, orange brown, sandy, gravelly clay. Gravel is of fine to coarse, subangular to subrounded, poorly sorted, mixed lithology. Occasional cobbles and timber fragments. Loose section of brick wall, concrete blocks and metal at 1.00m depth. [FILL].				DD46	0.60			
Firm to stiff consistency, dark grey brown, slightly sandy, gravelly CLAY. Gravel is of fine to coarse, subangular to subrounded, poorly sorted, mixed lithology. Rare cobbles of mudstone. [GLACIAL TILL].	1.70	60.50		DD47	1.80			
				DD48	2.80			
End of Exploratory Hole at 3.00 m	3.00	59.20						
Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with arisings. 4. Sides of pits unstable. 5. Log based on field engineers notes to BSEN 14688-1.						Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample		Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading
Sheet:						Sheet 1 of 1		

Exploratory Hole ID: WS1	Client: Gladman Developments Limited					 www.opusinternational.co.uk		
Job No: J_D0968	Site: Henthorn Lane, Clitheroe					Start Date: 03/05/2012		End Date: 03/05/2012
Drilling Equipment/ Excavation Method: Archway Competitor Window Sample Rig		Co-ords: 372788E - 441152N		Backfill Date: 03/05/2012		Field Records: RGB16-01-12		
		Ground Level (mAOD): 57.500		Logged: RGB		Chkd: 	Appr: 	
Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
Dark brown, slightly sandy TOPSOIL with common fine roots.	0.20	57.30		DD101	0.10			
Firm consistency, brown and grey mottled, slightly gravelly, CLAY. Gravel is of subangular to subrounded sandstone and mudstone fragments. [GLACIAL TILL].	0.70	56.80				V= 54 kPa V= 26 kPa N=13(C) V= 85 kPa		
Soft to firm consistency, brown, gravelly CLAY with occasional subangular fine grained sandstone cobbles. Gravel is of sub angular to subrounded sandstone and mudstone. [GLACIAL TILL].	0.95	56.55						
Stiff consistency, brown, gravelly CLAY with occasional subangular sandstone cobbles. Gravel is of mainly coarse sub angular sandstone. [GLACIAL TILL].						V= 116 kPa N=14(C) V= 90 kPa		
Firm to stiff consistency, brown silty CLAY. [GLACIAL TILL].	2.90	54.60		DD102	2.80	V= 102 kPa N=13(C) V= 62 kPa V= 60 kPa V= 60 kPa		
Firm consistency, brown silty CLAY. [GLACIAL TILL].	3.75	53.75		DD103	3.70	V= 45 kPa N=12(C) V= 42 kPa V= 40 kPa N=19(C) V= 46 kPa		
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
								
End of Exploratory Hole at 8.00 m		8.00	49.50					
Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with bentonite, gravel and arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.					Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample		Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading	
					Sheet: Sheet 1 of 1			

Exploratory Hole ID: WS2A	Client: Gladman Developments Limited		 www.opusinternational.co.uk	
Job No: J_D0968	Site: Henthorn Lane, Clitheroe			
Drilling Equipment/ Excavation Method: Archway Competitor Window Sample Rig		Co-ords: 372906E - 441119N	Start Date: 03/05/2012	End Date: 03/05/2012
		Ground Level (mAOD): 62.200	Backfill Date: 03/05/2012	Field Records: RGB16-01-12
		Logged: RGB	Chkd: 	Appr: 

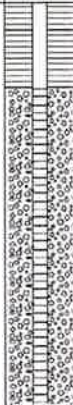
Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
Dark Brown sandy TOPSOIL with common fine roots.	0.20	62.00		DD105	0.50	V= 60 kPa N=12(C)		
Firm consistency, brown and grey mottled, slightly sandy, gravelly CLAY with fine roots. Gravel is of subangular fine grained sandstone and occasional small dark grey cobbles. [GLACIAL TILL].	1.00	61.20						
Firm consistency, brown and grey, slightly sandy, gravelly CLAY. Gravel is of subangular to subrounded sandstone and mudstone. [GLACIAL TILL].	1.70	60.50						
End of Exploratory Hole at 1.70 m								

Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.	Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample	Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading
	Sheet: Sheet 1 of 1	

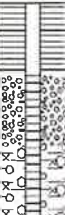
Exploratory Hole ID: WS2B	Client: Gladman Developments Limited					 www.opusinternational.co.uk		
Job No: J_D0968	Site: Henthorn Lane, Clitheroe					Start Date: 03/05/2012		End Date: 03/05/2012
Drilling Equipment/ Excavation Method: Archway Competitor Window Sample Rig					Co-ords: 372901E - 441110N		Backfill Date: 03/05/2012	
					Ground Level (mAOD): 62.200		Field Records: RGB16-01-12	
					Logged: RGB		Chkd: 	Appr: 
Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
Dark Brown sandy TOPSOIL with common fine roots.	0.20	62.00						
Firm consistency, brown and grey mottled, slightly sandy, gravelly CLAY with fine roots. Gravel is of subangular fine grained sandstone and occasional small dark grey cobbles. [GLACIAL TILL].	0.80	61.40				N=10(C)		
Firm consistency, brown, gravelly CLAY with occasional cobbles of sandstone. Gravel is of dark grey sandstone and mudstone. [GLACIAL TILL].						N=11(C)		
						N=21(C)		
						N=56(C)		
End of Exploratory Hole at 4.00 m	4.00	58.20		DD106	3.50			
Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.					Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample		Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading	
					Sheet: Sheet 1 of 1			

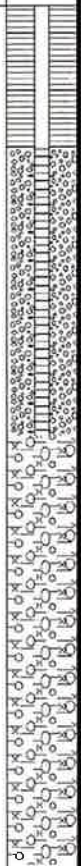
Exploratory Hole ID: WS3	Client: Gladman Developments Limited		 www.opusinternational.co.uk					
Job No: J_D0968	Site: Henthorn Lane, Clitheroe							
Drilling Equipment/ Excavation Method: Archway Competitor Window Sample Rig		Co-ords: 373067E - 441170N	Start Date: 03/05/2012	End Date: 03/05/2012				
		Ground Level (mAOD): 60.600	Backfill Date: 03/05/2012	Field Records: RGB16-01-12				
		Logged: RGB	Chkd: 	Appr: 				
Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
Dark Brown sandy, clayey TOPSOIL with common fine roots.	0.20	60.40				V= 61 kPa V= 56 kPa V= 78 kPa V= 60 kPa N=16(C)		
Firm consistency, grey and brown mottled, silty, sandy CLAY with occasional fine roots. [GLACIAL TILL].	0.90	59.70				V= 71 kPa V= 75 kPa N=32(C)		
Firm to stiff consistency, dark grey, sandy gravelly CLAY. Gravel is mainly subangular to subrounded, dark grey, sandstone and mudstone. [GLACIAL TILL].	2.00	58.60						
Firm to stiff consistency, dark grey, slightly sandy gravelly CLAY. Gravel is mainly medium to coarse grade, subangular to subrounded, dark grey, sandstone and mudstone. [GLACIAL TILL].	2.70	57.90						
Firm to stiff consistency, dark grey, slightly sandy, very gravelly CLAY. Gravel is well graded, grey and dark grey, fine grained sandstone. [GLACIAL TILL].	3.80	56.80		DD107	3.00	N=32(C) N=251(C)		
End of Exploratory Hole at 3.80 m								
Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with bentonite, gravel and arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.						Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample	Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading	
						Sheet: Sheet 1 of 1		

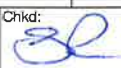
Exploratory Hole ID:	Client: Gladman Developments Limited				 www.opusinternational.co.uk			
WS4	Site: Henthorn Lane, Clitheroe							
Job No:	J_D0968							
Drilling Equipment/ Excavation Method:		Co-ords:		Start Date:		End Date:		
Archway Competitor Window Sample Rig		373052E - 441068N		03/05/2012		03/05/2012		
		Ground Level (mAOD):		Backfill Date:		Field Records:		
		59.600		03/05/2012		RGB16-01-12		
				Logged: RGB		Chkd:  Appr: 		

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND: Brown sandy clayey topsoil with fine roots.	0.22	59.38		DD108	0.30	N=18(C)		
MADE GROUND: Dark brown topsoil, sandy gravel. Gravel is coarse. Occasional cobbles of coarse grained pink and yellow sandstone.	0.55	59.05						
Stiff consistency, brown, gravelly CLAY. Gravel is of sub angular limestone, sandstone and mudstone.	1.50	58.10						
Firm consistency, dark grey, sandy, gravelly CLAY. Gravel is dark grey to grey, subangular to subrounded sandstone. [GLACIAL TILL].	2.80	56.80						
End of Exploratory Hole at 2.80 m								

Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with bentonite and gravel. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.	Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample	Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading
Sheet: Sheet 1 of 1		

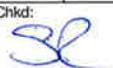
Exploratory Hole ID:	Client: Gladman Developments Limited				 www.opusinternational.co.uk			
WS5	Site: Henthorn Lane, Clitheroe							
Job No: J_D0968								
Drilling Equipment/ Excavation Method: Archway Competitor Window Sample Rig		Co-ords: 373166E - 440998N		Start Date: 03/05/2012		End Date: 03/05/2012		
		Ground Level (mAOD): 62.200		Backfill Date: 03/05/2012		Field Records: RGB16-01-12		
				Logged: RGB		Chkd:  Appr: 		
Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
Dark brown, sandy, clayey TOPSOIL with occasional fragments of coal and limestone.	0.18	62.02		DD109	0.10	V= 58 kPa N=10(C)		
Firm consistency, brown and grey mottled, sandy, gravelly CLAY. Gravel is of dark grey and black, fine grained sandstone with cobbles. [GLACIAL TILL].								
End of Exploratory Hole at 1.50 m	1.50	60.70						
Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with bentonite, gravel and arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.					Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample		Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading	
					Sheet:			
					Sheet 1 of 1			

Exploratory Hole ID:	Client: Gladman Developments Limited					 www.opusinternational.co.uk				
WS6	Site: Henthorn Lane, Clitheroe									
Job No:	J_D0968					Start Date:		End Date:		
						03/05/2012		03/05/2012		
Drilling Equipment/ Excavation Method: Archway Competitor Window Sample Rig					Co-ords:		Backfill Date:		Field Records:	
					373067E - 440886N		03/05/2012		RGB16-01-12	
					Ground Level (mAOD):		Logged:		Chkd: Appr:	
					61.100		RGB		 	
Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests		Groundwater Records	Backfill Details	
Dark grey, sandy, clayey TOPSOIL with fine roots and occasional fine mudstone gravel.	0.16	60.94		DD110	0.10	V= 52 kPa V= 70 kPa N=13(C) N=13(C) N=12(C) N=20(C) N=25(C) N=43(C)				
Firm consistency, grey and brown mottled, sandy, gravelly CLAY. Gravel is of fine grade, dark grey sandstone and mudstone. [GLACIAL TILL].	0.70	60.40								
Firm consistency, brown, slightly sandy, gravelly CLAY. Gravel is of fine grade subangular, dark grey sandstone and limestone. [GLACIAL TILL].	1.75	59.35								
Firm consistency, grey, gravelly CLAY. Gravel is fine grainel, subangular and angular, grey sandstone and limestone. [GLACIAL TILL].	3.10	58.00								
Firm consistency, grey, sandy, gravelly CLAY. Gravel is fine to medium grained, subrounded to well rounded mudstone. [GLACIAL TILL].	6.00	55.10								
End of Exploratory Hole at 6.00 m										
Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with bentonite, gravel and arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.						Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample		Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Pentrometer Reading PID - PID Reading V - Hand Shear Vane Reading		
						Sheet: Sheet 1 of 1				

Exploratory Hole ID:	Client: Gladman Developments Limited					 www.opusinternational.co.uk				
WS7	Site: Henthorn Lane, Clitheroe									
Job No:	J_D0968					Start Date:		End Date:		
					03/05/2012		03/05/2012			
Drilling Equipment/ Excavation Method:					Co-ords:		Backfill Date:		Field Records:	
Archway Competitor Window Sample Rig					373059E - 440930N		03/05/2012		RGB16-01-12	
					Ground Level (mAOD):		Logged:		Chkd: Appr:	
					61.400		RGB		 	

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
Dark brown, sandy, silty TOPSOIL with common fine roots.	0.15	61.25		DD112	0.10	V = 55 kPa V = 71 kPa		
Firm consistency, mottled grey and brown, sandy, slightly gravelly CLAY. Gravel is of dark grey sandstone and limestone. [GLACIAL TILL].	0.70	60.70		DD113	0.50			
Firm consistency, brown, slightly sandy, gravelly CLAY. Gravel is of subrounded, fine grained, dark grey sandstone. [GLACIAL TILL].	1.20	60.20						
Firm to stiff consistency, grey, very gravelly CLAY with occasional small cobbles. Gravel is subangular to subrounded, grey sandstone. [GLACIAL TILL].								
End of Exploratory Hole at 3.00 m	3.00	58.40						

Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.	Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample	Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading
Sheet: Sheet 1 of 1		

Exploratory Hole ID: WS8	Client: Gladman Developments Limited					 www.opusinternational.co.uk			
Job No: J_D0968	Site: Henthorn Lane, Clitheroe					Start Date: 03/05/2012		End Date: 03/05/2012	
Drilling Equipment/ Excavation Method: Archway Competitor Window Sample Rig			Co-ords: 373127E - 440902N		Backfill Date: 03/05/2012		Field Records: RGB16-01-12		
			Ground Level (mAOD): 61.300		Logged: RGB		Chkd: 		Appr: 
Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details	
Dark brown, sandy TOPSOIL with fine roots and old roots.	0.20	61.10		DD114	0.10				
Firm consistency, brown and grey mottled, sandy, gravelly CLAY. Gravel is fine to medium grade, subangular to subrounded sandstone and limestone. [GLACIAL TILL].	1.00	60.30		DD115	0.60				
Firm consistency, greyey brown, gravelly CLAY. Gravel is subangular, grey, sandstone. [GLACIAL TILL].	1.20	60.10							
Firm to stiff consistency, grey, gravelly CLAY. Gravel is subangular, grey sandstone. [GLACIAL TILL].									
End of Exploratory Hole at 3.00 m	3.00	58.30							
Remarks: 1. No groundwater encountered. 2. Machine dug pit. 3. Backfilled with arisings. 4. Sides of pits stable. 5. Log based on field engineers notes to BSEN 14688-1.					Sample Type Key D - Disturbed Representative B - Bulk Representative S - Spot Non-Representative W - Water U - Undisturbed Representative J - Jar Sample		Test Type Key (C) - Cone SPT (S) - Spoon SPT P - Pocket Penetrometer Reading PID - PID Reading V - Hand Shear Vane Reading		
					Sheet: Sheet 1 of 1				

APPENDIX B

Contamination Test Results



Scientific Analysis Laboratories is a
limited company registered in England and
Wales (No 2514788) whose address is at
Hadfield House, Hadfield Street, Manchester M16 9FE

Scientific Analysis Laboratories Ltd

Certificate of Analysis

Hadfield House
Hadfield Street
Cornbrook
Manchester
M16 9FE
Tel : 0161 874 2400
Fax : 0161 874 2468

Report Number: 278281-1

Date of Report: 21-May-2012

Customer: OPUS International Consultants (UK) Ltd.
1-2 Aire House
Sidings Court
DONCASTER
DN4 5NL

Customer Contact: Mr Robert Battrick

Customer Job Reference: J-D0968

Customer Purchase Order: 35842

Customer Site Reference: Henthorn Lane, Clitheroe

Date Job Received at SAL: 09-May-2012

Date Analysis Started: 10-May-2012

Date Analysis Completed: 18-May-2012

The results reported relate to samples received in the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs



Report checked
and authorised by :
Caroline Haworth
Assistant Customer Service
Manager

Issued by :
Caroline Haworth
Assistant Customer Service
Manager

SAL Reference: 278281 Project Site: Henthorn Lane, Clitheroe Customer Reference: J-D0968											
Soil		Analysed as Soil									
MCERTS Preparation											
SAL Reference		278281 001		278281 002		278281 003		278281 004		278281 005	
Customer Sample Reference		TP1 0.15 D1		TP3 0.15 D5		TP3 0.8 D6		TP4 0.1 D7		TP6 0.15 D11	
Date Sampled		04-MAY-2012		04-MAY-2012		04-MAY-2012		04-MAY-2012		04-MAY-2012	
Bottom Depth		0.15		0.15		0.80		0.10		0.15	
Type		Topsoil		Topsoil		Clay		Topsoil		Topsoil	
Determinand	Method	Test Sample	LOD	Units							
Moisture	T277	AR	0.1	%	34	34	24	20	29		
Moisture @ 105 C	T162	AR	0.1	%	39	38	25	39	47		

SAL Reference: 278281 Project Site: Henthorn Lane, Clitheroe Customer Reference: J-D0968 Soil Analysed as Soil MCERTS Preparation									
SAL Reference				278281 006	278281 007	278281 008	278281 009	278281 010	
Customer Sample Reference				TP7 0.6 D15	TP8 0.15 D19	TP12 0.1 D29	TP12 0.7 D30	TP12 0.95 D31	
Date Sampled				04-MAY-2012	04-MAY-2012	04-MAY-2012	04-MAY-2012	04-MAY-2012	
Bottom Depth				0.60	0.15	0.10	0.70	0.95	
Type				Clay	Topsoil	Clay	Clay	Clay	
Determinand	Method	Test Sample	LOD	Units					
Moisture	T277	AR	0.1	%	23	30	34	22	12
Moisture @ 105 C	T162	AR	0.1	%	25	28	38	22	10

SAL Reference: 278281									
Project Site: Henthorn Lane, Clitheroe									
Customer Reference: J-D0968									
Soil					Analysed as Soil				
MCERTS Preparation									
SAL Reference					278281 011	278281 012	278281 013	278281 014	278281 015
Customer Sample Reference					TP13 0.75 D34	TP14 1 D35	TP15 0.7 D37	TP17 0.2 D41	TP19 0.1 D45
Date Sampled					04-MAY-2012	04-MAY-2012	04-MAY-2012	04-MAY-2012	04-MAY-2012
Bottom Depth					0.75	1.00	0.70	0.20	0.10
Type					Clay	Sandy Soil	Clay	Topsoil	Clay
Determinand	Method	Test Sample	LOD	Units					
Moisture	T277	AR	0.1	%	19	14	13	42	17
Moisture @ 105 C	T162	AR	0.1	%	23	12	24	46	22

SAL Reference: 278281									
Project Site: Henthorn Lane, Clitheroe									
Customer Reference: J-D0968									
Soil					Analysed as Soil				
MCERTS Preparation									
SAL Reference					278281 016	278281 017	278281 018	278281 019	278281 020
Customer Sample Reference					TP19 0.6 D46	WS1 0.1 D101	WS4 0.3 D108	WS6 0.1 D110	WS8 0.1 D114
Date Sampled					04-MAY-2012	04-MAY-2012	04-MAY-2012	04-MAY-2012	04-MAY-2012
Bottom Depth					0.60	0.10	0.30	0.10	0.10
Type					Sandy Soil	Topsoil	Sandy Soil	Topsoil	Topsoil
Determinand	Method	Test Sample	LOD	Units					
Moisture	T277	AR	0.1	%	11	39	16	40	36
Moisture @ 105 C	T162	AR	0.1	%	6.9	36	31	44	42

SAL Reference: 278281									
Project Site: Henthorn Lane, Clitheroe									
Customer Reference: J-D0968									
Soil					Analysed as Soil				
Miscellaneous									
SAL Reference					278281 008	278281 009	278281 010	278281 015	278281 016
Customer Sample Reference					TP12 0.1 D29	TP12 0.7 D30	TP12 0.95 D31	TP19 0.1 D45	TP19 0.6 D46
Date Sampled					04-MAY-2012	04-MAY-2012	04-MAY-2012	04-MAY-2012	04-MAY-2012
Bottom Depth					0.10	0.70	0.95	0.10	0.60
Type					Clay	Clay	Clay	Clay	Sandy Soil
Determinand		Method	Test Sample	LOD	Units				
Asbestos		T27	AR			N.D.	N.D.	N.D.	N.D.

SAL Reference: 278281 Project Site: Henthorn Lane, Clitheroe Customer Reference: J-D0968 Soil Analysed as Soil Miscellaneous					
SAL Reference		278281 018			
Customer Sample Reference		WS4 0.3 D108			
Date Sampled		04-MAY-2012			
Bottom Depth		0.30			
Type		Sandy Soil			
Determinand		Method	Test Sample	LOD	Units
Asbestos		T27	AR		N.D.

SAL Reference: 278281									
Project Site: Henthorn Lane, Clitheroe									
Customer Reference: J-D0968									
Soil		Analysed as Soil							
Opus (Wetherby)									
SAL Reference				278281 001	278281 002	278281 003	278281 004	278281 005	
Customer Sample Reference				TP1 0.15 D1	TP3 0.15 D5	TP3 0.8 D6	TP4 0.1 D7	TP6 0.15 D11	
Date Sampled				04-MAY-2012	04-MAY-2012	04-MAY-2012	04-MAY-2012	04-MAY-2012	
Bottom Depth				0.15	0.15	0.80	0.10	0.15	
Type				Topsoil	Topsoil	Clay	Topsoil	Topsoil	
Determinand	Method	Test Sample	LOD	Units					
pH	T7	AR			6.8	6.5	6.4	6.2	6.0
Arsenic	T6	M40	2	mg/kg	17	15	13	13	12
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	53	180	32	42	27
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1
Copper	T6	M40	1	mg/kg	48	110	27	35	21
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1	<1	<1
Lead	T6	M40	1	mg/kg	96	73	37	57	60
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	40	97	50	42	25
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Zinc	T6	M40	1	mg/kg	200	250	270	190	140
SO4(Total)	T6	AR	0.01	%	0.19	0.19	0.06	0.12	0.12
SO4(2:1)	T6	AR	0.1	g/l	<0.1	<0.1	<0.1	<0.1	<0.1
Total Organic Carbon	T21	M40	0.1	%	4.4	4.9	1.4	3.3	3.4

SAL Reference: 278281 Project Site: Henthorn Lane, Clitheroe Customer Reference: J-D0968 Soil Analysed as Soil Opus (Wetherby)									
SAL Reference					278281 006	278281 007	278281 008	278281 009	278281 010
Customer Sample Reference					TP7 0.6 D15	TP8 0.15 D19	TP12 0.1 D29	TP12 0.7 D30	TP12 0.95 D31
Date Sampled					04-MAY-2012	04-MAY-2012	04-MAY-2012	04-MAY-2012	04-MAY-2012
Bottom Depth					0.60	0.15	0.10	0.70	0.95
Type					Clay	Topsoil	Clay	Clay	Clay
Determinand	Method	Test Sample	LOD	Units					
pH	T7	AR			6.6	6.3	-	7.6	7.4
Arsenic	T6	M40	2	mg/kg	10	13	15	8	7
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	25	27	27	19	13
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1
Copper	T6	M40	1	mg/kg	15	23	31	18	15
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1	<1	<1
Lead	T6	M40	1	mg/kg	39	65	64	23	18
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	23	22	37	32	23
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Zinc	T6	M40	1	mg/kg	110	150	140	110	96
SO4(Total)	T6	AR	0.01	%	0.07	0.13	0.18	0.07	1.1
SO4(2:1)	T6	AR	0.1	g/l	<0.1	<0.1	<0.1	<0.1	0.1
Total Organic Carbon	T21	M40	0.1	%	1.7	3.3	5.5	4.0	4.4

SAL Reference: 278281 Project Site: Henthorn Lane, Clitheroe Customer Reference: J-D0968 Soil Analysed as Soil Opus (Wetherby)									
SAL Reference					278281 011	278281 012	278281 013	278281 014	278281 015
Customer Sample Reference					TP13 0.75 D34	TP14 1 D35	TP15 0.7 D37	TP17 0.2 D41	TP19 0.1 D45
Date Sampled					04-MAY-2012	04-MAY-2012	04-MAY-2012	04-MAY-2012	04-MAY-2012
Bottom Depth					0.75	1.00	0.70	0.20	0.10
Type					Clay	Sandy Soil	Clay	Topsoil	Clay
Determinand	Method	Test Sample	LOD	Units					
pH	T7	AR			7.2	7.5	7.7	7.0	7.4
Arsenic	T6	M40	2	mg/kg	5	7	7	14	8
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	22	18	15	31	19
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1
Copper	T6	M40	1	mg/kg	9	19	18	50	18
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1	<1	<1
Lead	T6	M40	1	mg/kg	18	31	21	120	29
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	18	23	28	27	28
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Zinc	T6	M40	1	mg/kg	48	100	110	210	130
SO4(Total)	T6	AR	0.01	%	0.08	0.13	0.08	0.37	0.09
SO4(2:1)	T6	AR	0.1	g/l	<0.1	<0.1	<0.1	<0.1	<0.1
Total Organic Carbon	T21	M40	0.1	%	0.7	2.7	2.1	9.9	3.1

Analysed as Soil

SAL Reference					278281 016	278281 017	278281 018	278281 019	278281 020
Customer Sample Reference					TP19 0.6 D46	WS1 0.1 D101	WS4 0.3 D108	WS6 0.1 D110	WS8 0.1 D114
Date Sampled					04-MAY-2012	04-MAY-2012	04-MAY-2012	04-MAY-2012	04-MAY-2012
Bottom Depth					0.60	0.10	0.30	0.10	0.10
Type					Sandy Soil	Topsoil	Sandy Soil	Topsoil	Topsoil
Determinand	Method	Test Sample	LOD	Units					
pH	T7	AR			7.7	7.2	-	7.2	7.0
Arsenic	T6	M40	2	mg/kg	4	12	6	13	15
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	10	27	15	29	33
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1
Copper	T6	M40	1	mg/kg	12	25	13	37	45
Cyanide(Total)	T4	AR	1	mg/kg	<1	<1	<1	<1	<1
Lead	T6	M40	1	mg/kg	23	72	37	140	150
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	1
Nickel	T6	M40	1	mg/kg	9	21	13	18	23
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Zinc	T6	M40	1	mg/kg	63	150	150	190	190
SO4(Total)	T6	AR	0.01	%	0.10	0.19	0.10	0.29	0.34
SO4(2:1)	T6	AR	0.1	g/l	<0.1	<0.1	<0.1	<0.1	<0.1
Total Organic Carbon	T21	M40	0.1	%	1.7	5.1	2.1	9.0	8.8

Analysed as Soil

Total Petroleum Hydrocarbons CWG

SAL Reference					278281 008	278281 009	278281 015	278281 016	278281 018
Customer Sample Reference					TP12 0.1 D29	TP12 0.7 D30	TP19 0.1 D45	TP19 0.6 D46	WS4 0.3 D108
Date Sampled					04-MAY-2012	04-MAY-2012	04-MAY-2012	04-MAY-2012	04-MAY-2012
Bottom Depth					0.10	0.70	0.10	0.60	0.30
Type					Clay	Clay	Clay	Sandy Soil	Sandy Soil
Determinand	Method	Test Sample	LOD	Units					
Benzene	T209	M105	10	µg/kg	<10	(2) <20	<10	<10	<10
Toluene	T209	M105	10	µg/kg	<10	(2) <20	<10	<10	<10
EthylBenzene	T209	M105	10	µg/kg	<10	(2) <20	<10	<10	<10
M/P Xylene	T209	M105	10	µg/kg	<10	(2) <20	<10	<10	<10
O Xylene	T209	M105	10	µg/kg	<10	(2) <20	<10	<10	<10
Methyl tert-Butyl Ether	T209	M105	10	µg/kg	<10	(2) <20	<10	<10	<10
TPH (C5-C6 aliphatic)	T209	M105	0.100	mg/kg	<0.100	(2) <0.200	<0.100	<0.100	<0.100
TPH (C6-C8 aliphatic)	T209	M105	0.10	mg/kg	<0.10	(2) <0.20	<0.10	<0.10	<0.10
TPH (C8-C10 aliphatic)	T209	M105	0.100	mg/kg	<0.100	(2) <0.200	<0.100	<0.100	<0.100
TPH (C10-C12 aliphatic)	T206	M105	1	mg/kg	<1	<1	<1	(9) <10	<1
TPH (C12-C16 aliphatic)	T206	M105	2	mg/kg	<2	<2	<2	(9) <10	<2
TPH (C16-C21 aliphatic)	T206	M105	1	mg/kg	<1	<1	<1	(9) <10	<1
TPH (C21-C35 aliphatic)	T206	M105	4	mg/kg	<4	<4	<4	(9) <10	<4
TPH (C6-C7 aromatic)	T209	M105	0.100	mg/kg	<0.100	(2) <0.200	<0.100	<0.100	<0.100
TPH (C7-C8 aromatic)	T209	M105	0.100	mg/kg	<0.100	(2) <0.200	<0.100	<0.100	<0.100
TPH (C8-C10 aromatic)	T209	M105	0.100	mg/kg	<0.100	(2) <0.200	<0.100	<0.100	<0.100
TPH (C10-C12 aromatic)	T8	M105	1	mg/kg	<1	<1	<1	(9) <10	<1
TPH (C12-C16 aromatic)	T8	M105	1	mg/kg	<1	<1	<1	(9) <10	<1
TPH (C16-C21 aromatic)	T206	M105	1	mg/kg	3	<1	<1	(9) <10	2
TPH (C21-C35 aromatic)	T206	M105	1	mg/kg	11	<1	<1	21	5

SAL Reference: 278281 Project Site: Henthorn Lane, Clitheroe Customer Reference: J-D0968 Soil Analysed as Soil Organophosphorous insecticides									
SAL Reference					278281 001	278281 002	278281 004	278281 005	278281 014
Customer Sample Reference					TP1 0.15 D1	TP3 0.15 D5	TP4 0.1 D7	TP6 0.15 D11	TP17 0.2 D41
Date Sampled					04-MAY-2012	04-MAY-2012	04-MAY-2012	04-MAY-2012	04-MAY-2012
Bottom Depth					0.15	0.15	0.10	0.15	0.20
Type					Topsoil	Topsoil	Topsoil	Topsoil	Topsoil
Determinand	Method	Test Sample	LOD	Units					
Azinphos methyl	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Diazinon	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Dichlorvos	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Dimethoate	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Fenitrothion	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Malathion	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Mevinphos	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Parathion	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Pirimiphos methyl	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01

SAL Reference: 278281 Project Site: Henthorn Lane, Clitheroe Customer Reference: J-D0968 Soil Analysed as Soil Organophosphorous insecticides									
SAL Reference					278281 015	278281 017	278281 018	278281 019	278281 020
Customer Sample Reference					TP19 0.1 D45	WS1 0.1 D101	WS4 0.3 D108	WS6 0.1 D110	WS8 0.1 D114
Date Sampled					04-MAY-2012	04-MAY-2012	04-MAY-2012	04-MAY-2012	04-MAY-2012
Bottom Depth					0.10	0.10	0.30	0.10	0.10
Type					Clay	Topsoil	Sandy Soil	Topsoil	Topsoil
Determinand	Method	Test Sample	LOD	Units					
Azinphos methyl	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Diazinon	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Dichlorvos	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Dimethoate	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Fenitrothion	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Malathion	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Mevinphos	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Parathion	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01
Pirimiphos methyl	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01

SAL Reference: 278281 Project Site: Henthorn Lane, Clitheroe Customer Reference: J-D0968 Soil Analysed as Soil Suite D									
SAL Reference					278281 008	278281 009	278281 015	278281 016	278281 018
Customer Sample Reference					TP12 0.1 D29	TP12 0.7 D30	TP19 0.1 D45	TP19 0.6 D46	WS4 0.3 D108
Date Sampled					04-MAY-2012	04-MAY-2012	04-MAY-2012	04-MAY-2012	04-MAY-2012
Bottom Depth					0.10	0.70	0.10	0.60	0.30
Type					Clay	Clay	Clay	Sandy Soil	Sandy Soil
Determinand	Method	Test Sample	LOD	Units					
Chloride (2:1)	T11	AR	0.5	mg/l	6.3	2.7	2.5	2.3	1.5
Magnesium water soluble	T6	AR	0.1	g/l	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrate (2:1)	T11	AR	1.0	mg/l	<1.0	<1.0	<1.0	1.8	4.9
pH	T7	AR			7.4	-	-	-	7.4
SO4(2:1) as SO3	T6	AR	0.1	g/l	<0.1	<0.1	<0.1	<0.1	<0.1

Index to symbols used in 278281-1

Value	Description
M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
AR	As Received
M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C
N.D.	Not Detected
2	LOD Raised Due to Matrix Interference
9	LOD raised due to dilution of sample
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Method Index

Value	Description
T162	Grav (1 Dec) (105 C)
T209	GC/MS(Head Space)(MCERTS)
T206	GC/FID (MCERTS)
T27	PLM
T4	Colorimetry
T21	OX/IR
T1	GC/MS (HR)
T8	GC/FID
T277	Grav (1 Dec) (40 C)
T207	GC/MS(MCERTS)
T6	ICP/OES
T7	Probe
T16	GC/MS
T11	IC

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
Azinphos methyl	T16	AR	0.01	mg/kg	U	001-002,004-005,014-015,017-020
Diazinon	T16	AR	0.01	mg/kg	U	001-002,004-005,014-015,017-020
Dichlorvos	T16	AR	0.01	mg/kg	U	001-002,004-005,014-015,017-020
Dimethoate	T16	AR	0.01	mg/kg	U	001-002,004-005,014-015,017-020
Fenitrothion	T16	AR	0.01	mg/kg	U	001-002,004-005,014-015,017-020
Malathion	T16	AR	0.01	mg/kg	U	001-002,004-005,014-015,017-020
Mevinphos	T16	AR	0.01	mg/kg	U	001-002,004-005,014-015,017-020
Parathion	T16	AR	0.01	mg/kg	U	001-002,004-005,014-015,017-020
Pirimiphos methyl	T16	AR	0.01	mg/kg	U	001-002,004-005,014-015,017-020
Aldrin	T16	AR	0.01	mg/kg	U	001-002,004-005,014-015,017-020
Chlordane	T16	AR	0.01	mg/kg	U	001-002,004-005,014-015,017-020
DDD	T16	AR	0.01	mg/kg	U	001-002,004-005,014-015,017-020
DDE	T16	AR	0.01	mg/kg	U	001-002,004-005,014-015,017-020
DDT	T16	AR	0.01	mg/kg	U	001-002,004-005,014-015,017-020
Dieldrin	T16	AR	0.01	mg/kg	U	001-002,004-005,014-015,017-020
Endosulphan	T16	AR	0.01	mg/kg	U	001-002,004-005,014-015,017-020
Endrin	T16	AR	0.01	mg/kg	U	001-002,004-005,014-015,017-020
Heptachlor	T16	AR	0.01	mg/kg	U	001-002,004-005,014-015,017-020
Heptachlor epoxide	T16	AR	0.01	mg/kg	U	001-002,004-005,014-015,017-020
Hexachlorobenzene	T1	AR	0.01	mg/kg	U	001-002,004-005,014-015,017-020
Hexachlorocyclohexane	T16	AR	0.01	mg/kg	U	001-002,004-005,014-015,017-020
pH	T7	AR			M	001-020
Arsenic	T6	M40	2	mg/kg	M	001-020
Boron (water-soluble)	T6	AR	1	mg/kg	N	001-020
Cadmium	T6	M40	1	mg/kg	M	001-020
Chromium	T6	M40	1	mg/kg	M	001-020
Chromium VI	T6	AR	1	mg/kg	N	001-020
Copper	T6	M40	1	mg/kg	M	001-020
Cyanide(Total)	T4	AR	1	mg/kg	U	001-020
Lead	T6	M40	1	mg/kg	M	001-020

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
Mercury	T6	M40	1	mg/kg	M	001-020
Nickel	T6	M40	1	mg/kg	M	001-020
Selenium	T6	M40	3	mg/kg	M	001-020
Zinc	T6	M40	1	mg/kg	M	001-020
SO4(Total)	T6	AR	0.01	%	N	001-020
SO4(2:1)	T6	AR	0.1	g/l	N	001-020
Total Organic Carbon	T21	M40	0.1	%	N	001-020
Asbestos	T27	AR			SU	008-010,015-016,018
Chloride (2:1)	T11	AR	0.5	mg/l	N	008-009,015-016,018
Magnesium water soluble	T6	AR	0.1	g/l	N	008-009,015-016,018
Nitrate (2:1)	T11	AR	1.0	mg/l	N	008-009,015-016,018
pH	T7	AR			U	008-009,015-016,018
SO4(2:1) as SO3	T6	AR	0.1	g/l	N	008-009,015-016,018
Benzene	T209	M105	10	µg/kg	M	008-009,015-016,018
Toluene	T209	M105	10	µg/kg	M	008-009,015-016,018
EthylBenzene	T209	M105	10	µg/kg	M	008-009,015-016,018
M/P Xylene	T209	M105	10	µg/kg	M	008-009,015-016,018
O Xylene	T209	M105	10	µg/kg	M	008-009,015-016,018
Methyl tert-Butyl Ether	T209	M105	10	µg/kg	M	008-009,015-016,018
TPH (C5-C6 aliphatic)	T209	M105	0.100	mg/kg	N	008-009,015-016,018
TPH (C6-C8 aliphatic)	T209	M105	0.10	mg/kg	N	008-009,015-016,018
TPH (C8-C10 aliphatic)	T209	M105	0.100	mg/kg	N	008-009,015-016,018
TPH (C10-C12 aliphatic)	T206	M105	1	mg/kg	N	008-009,015-016,018
TPH (C12-C16 aliphatic)	T206	M105	2	mg/kg	N	008-009,015-016,018
TPH (C16-C21 aliphatic)	T206	M105	1	mg/kg	M	008-009,015-016,018
TPH (C21-C35 aliphatic)	T206	M105	4	mg/kg	M	008-009,015-016,018
TPH (C6-C7 aromatic)	T209	M105	0.100	mg/kg	N	008-009,015-016,018
TPH (C7-C8 aromatic)	T209	M105	0.100	mg/kg	N	008-009,015-016,018
TPH (C8-C10 aromatic)	T209	M105	0.100	mg/kg	N	008-009,015-016,018
TPH (C10-C12 aromatic)	T8	M105	1	mg/kg	N	008-009,015-016,018
TPH (C12-C16 aromatic)	T8	M105	1	mg/kg	N	008-009,015-016,018
TPH (C16-C21 aromatic)	T206	M105	1	mg/kg	M	008-009,015-016,018
TPH (C21-C35 aromatic)	T206	M105	1	mg/kg	M	008-009,015-016,018
Naphthalene	T207	M105	0.1	mg/kg	M	001-020
Acenaphthylene	T207	M105	0.1	mg/kg	U	001-020
Acenaphthene	T207	M105	0.1	mg/kg	M	001-020
Fluorene	T207	M105	0.1	mg/kg	M	001-020
Phenanthrene	T207	M105	0.1	mg/kg	M	001-020
Anthracene	T207	M105	0.1	mg/kg	U	001-020
Fluoranthene	T207	M105	0.1	mg/kg	M	001-020
Pyrene	T207	M105	0.1	mg/kg	M	001-020
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	001-020
Chrysene	T207	M105	0.1	mg/kg	M	001-020
Benzo(b/k)Fluoranthene	T207	M105	0.1	mg/kg	M	001-020
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	001-020
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	001-020
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	001-020
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	001-020
PAH(total)	T207	M105	0.1	mg/kg	U	001-020
Moisture	T277	AR	0.1	%	N	001-020
Moisture @ 105 C	T162	AR	0.1	%	N	001-020

Methodology for the Screening of Soils in Terms of the Risk to Human Health (Including the Opus Methodology for Calculating Tier 1 Soil Screening Values)

The legislative framework for the regulation of contaminated land is contained in Part 2A of the Environmental Protection Act 1990, which was implemented in the Contaminated Land (England) Regulations 2000 (and subsequent amendments). This legislation allows for the identification and remediation of land where contamination is causing unacceptable risks to human health or the wider environment. The basis of the UK contaminated land policy is the 'Suitable for Use' approach, which states that land should be suitable for its current use and made suitable for any new use as official permission (through the planning process) is given for that use.

Under Part 2A of the Environmental Protection Act 1990, contaminated land is defined as land where 'significant harm' is being caused or there is a 'significant possibility of such harm' being caused or where 'significant pollution of controlled waters is being, or is likely to be caused'. For significant harm to occur, a contaminant linkage must exist i.e. there must be a contaminant, a relevant receptor and a plausible migration pathway by which the contaminant can cause significant harm to the receptor.

In April 2012, the Part 2A Statutory Guidance was revised and this has introduced four categories of land with respect to human health. Statutory contaminated land comprises Category 1 (where significant harm is being caused) and Category 2 (where significant possibility of such harm (SPOSH) is being caused). Category 3 is land not capable of being determined as SPOSH and Category 4 is uncontaminated.

Also in April 2012 the new National Planning Policy Framework was introduced in England. Under the NPPF, land should be suitable for its new use taking the effects of ground contamination into consideration. To this end adequate site investigation should be undertaken and this should be prepared by competent persons, such as Opus. After remediation, as a minimum, land should be incapable of being determined Part 2A contaminated land. Where a site is affected by contamination, responsibility for securing safe development rests with the developer and/or landowner.

The DEFRA impact assessment report accompanying the revised Part 2 Statutory Guidance, indicates that most developers will want to ensure their land is safely within Category 4 and this is the approach adopted by Opus in the preparation of this report. To assist with the implementation of Part 2A and contamination assessments under the planning process, DEFRA is commissioning a research project to derive new Category 4 Screening Levels (C4SLs). DEFRA envisage that the new C4SLs will replace the current Soil Guidelines Values (SGVs), which are considered indicative of minimal risk. It is proposed by DEFRA that the new C4SLs will be higher than the current SGVs. Until such a time as the new C4SLs are introduced Opus has continued to use the SGVs and other similarly derived generic assessment criteria.

The current SGVs published by the Environment Agency were derived using version 1.06 of the CLEA model. Where no SGVs exist for certain contaminants Opus has derived Tier 1 soil screening values (SSVs) and is currently utilising Version 2009.2 – Rev A, dated 25th August

2009. These Tier 1 SSVs are compliant with the Environment Agency recommended approach as set out in CLEA version 1.06.

The methodology employed to calculate these values is as follows:

Where available (arsenic, cadmium, BTEX, mercury, nickel, phenol and selenium) the SGV value at a suitable soil organic matter (SOM) content will be utilised. For compounds where no SGV has been published, Opus has derived Tier 1 SSVs utilising United Kingdom based toxicological data where available. However, where a TOX report is not available, reference has again been made to the Risk Assessment Information System (RAIS) database and other relevant toxicological database publication for toxicological information.

In relation to the petroleum hydrocarbon fractions, Opus has followed the procedures presented within the Mole Valley District Council position paper (Human Health Generic Assessment Criteria for Petroleum Hydrocarbons, dated May 2009). This document follows the procedures set out in the Environment Agency publications SC050021/SR7 and P5-080/TR3 (The UK Approach for Evaluating Human Health Risks from Petroleum Hydrocarbons in Soils). Additionally the Tier 1 screening values do not consider the additive or synergistic effects of any compounds.

The default parameters are accepted when running the model at a Tier 1 level to give the most conservative model except that the SOM is calculated with a range from 0.25% to 6% to be in line with current SGVs where a SOM of 6% has been adopted but also to look at natural soils which may have a lower SOM.

With regards to plant uptake, the guidance offered by the Environment Agency within their publication SC50021/SR3 has been adopted with relevant soil parameters being adjusted to 10°C where possible.

Lead cannot be modelled within the CLEA 1.04 software as the toxicological data is based on blood lead level rather than an ID or TDI. Consequently the lead value quoted has been determined using the initial algorithms within the SEGH 1993 model (Lead in soil: recommended guidelines, Wixson BG & Davies BE eds. Society for Environmental Geochemistry and Health, Science reviews).

APPENDIX C

Geotechnical Test Results



LABORATORY REPORT



4043

Contract Number: PSL12/1735

Client's Reference:

Report Date: 08 May 2012

Client Name: Opus
1-2 Aire House
Sidings Court
Richmond Business Park
Doncaster
DN4 5NL

For the attention of: Nicola Hughes

Contract Title: Clitheroe.

Date Received: 4-May-12

Date Commenced: 4-May-12

Date Completed: 8-May-12

Notes: Observations and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

R Gunson
(Director)

A Watkins
(Director)

M Beastall
(Laboratory Manager)

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test: 04-May-12

Test Position: CBR 1

Depth (m): 0.70

Plate Area (m2): 0.2827433

Type of Kentledge: Wheeled

Moisture Content (%)

20

Maximum Applied Pressure (kPa):

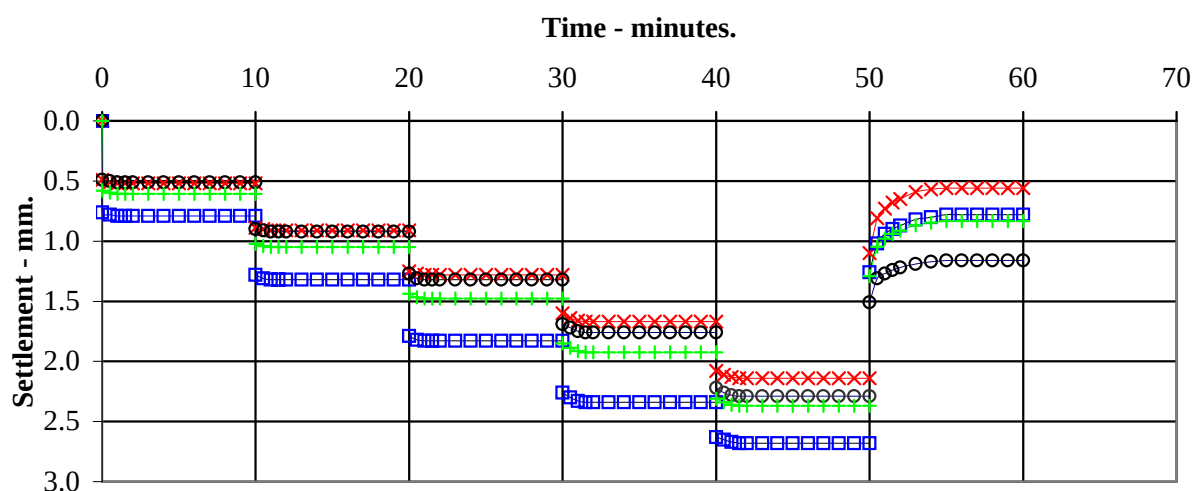
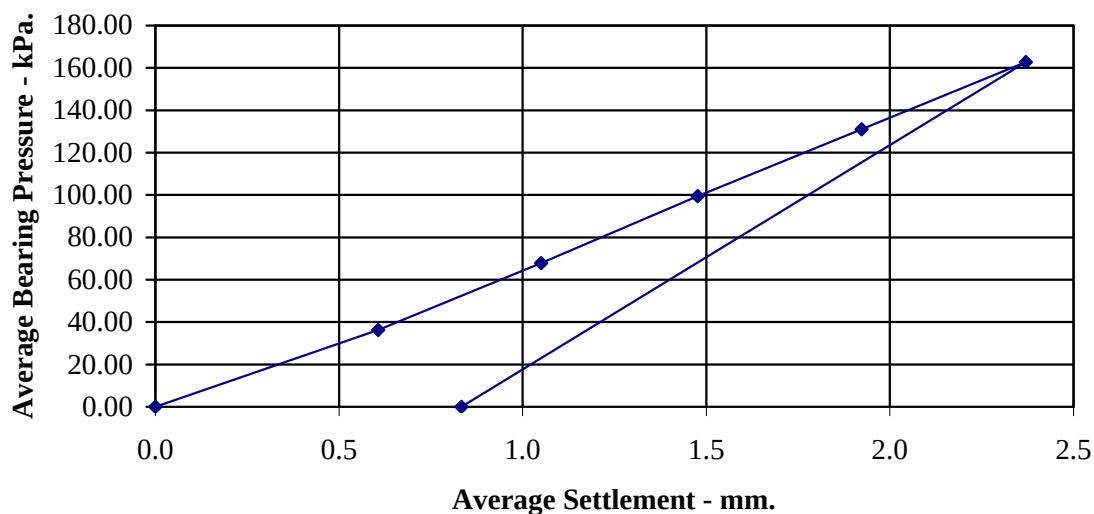
162.71

Maximum Deformation (mm):

2.37

Description:

Brown slightly gravelly
slightly sandy CLAY.



—x— Settlement Gauge 1 —□— Settlement Gauge 2 —○— Settlement Gauge 3 —+— Average Settlement

Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	08/05/12		08/05/12		08/05/12	PSL12/1735
CLITHEROE.						Page of

Calculation of Equivalent CBR Value from Plate Bearing Test
Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

Date of Test	4-May-12
Test Position	CBR 1
Depth (m)	0.70
Moisture Content(%)	20
Description	Brown slightly gravelly slightly sandy CLAY.
Maximum Deflection	2.37 mm
Deflection required for CBR value	1.25 mm
Load(@1.25mm)	82.0 kN/m ²
Plate diameter	600 mm
Conversion factor for plate diameter	0.804
K ₇₆₂ (modulus of subgrade reaction)	52.8 kN/m ² /mm
CBR Value	9.3 %

Checked/Approved	Date
	08/05/12

CLITHEROE.

Contract No.
PSL12/1735

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test: 04-May-12

Test Position: CBR 2

Depth (m): 0.35

Plate Area (m2): 0.2827433

Type of Kentledge: Wheeled

Moisture Content (%)

26

Maximum Applied Pressure (kPa):

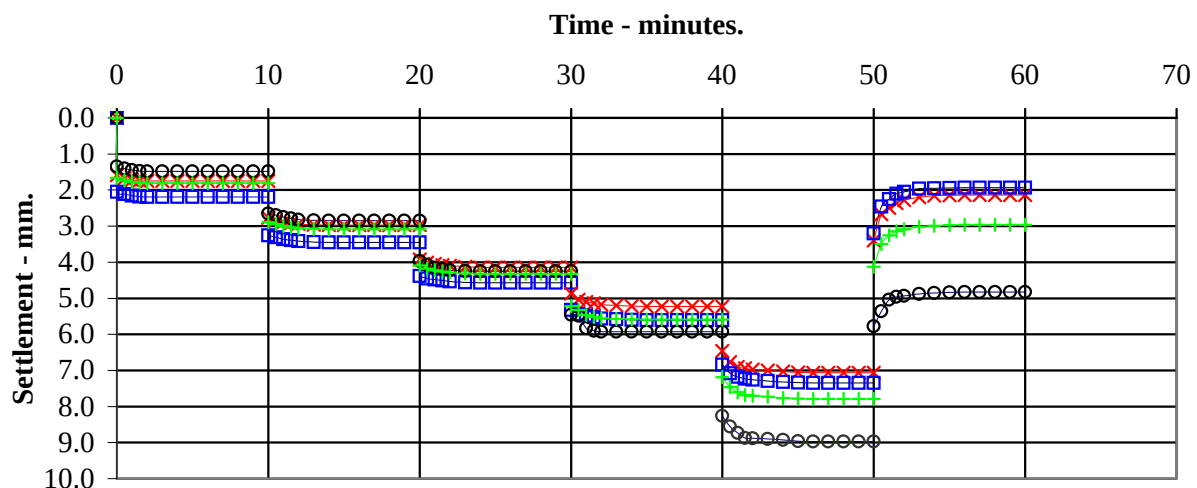
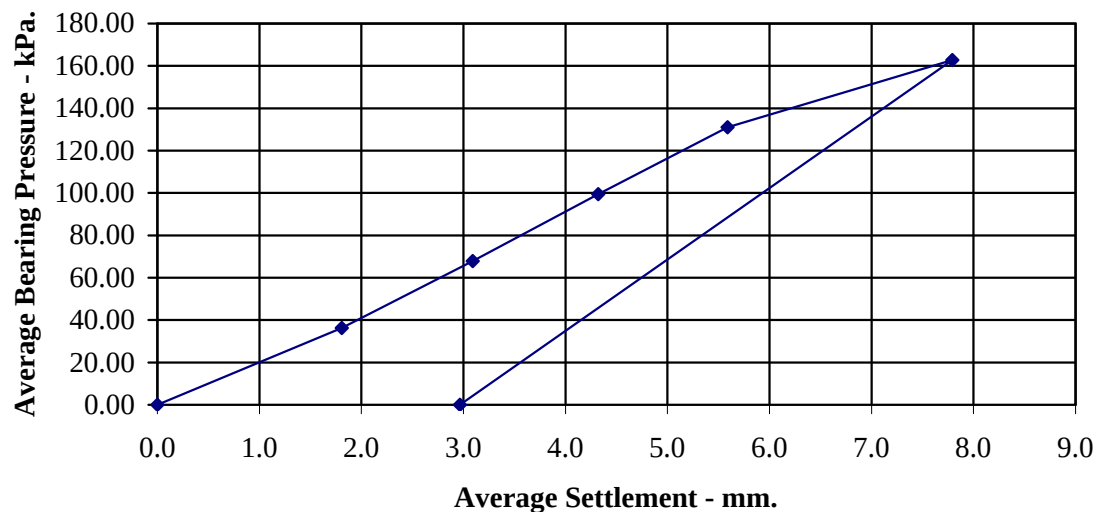
162.71

Maximum Deformation (mm):

7.79

Description:

Brown slightly gravelly sandy CLAY.



—x— Settlement Gauge 1 —□— Settlement Gauge 2 —○— Settlement Gauge 3 —+— Average Settlement

Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	08/05/12		08/05/12		08/05/12	PSL12/1735
CLITHEROE.						Page of

Calculation of Equivalent CBR Value from Plate Bearing Test
Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

Date of Test 4-May-12
Test Position CBR 2
Depth (m) 0.35
Moisture Content(%) 26
Description Brown slightly gravelly sandy CLAY.

Maximum Deflection 7.79 mm
Deflection required for CBR value 1.25 mm
Load(@1.25mm) 26.0 kN/m²
Plate diameter 600 mm
Conversion factor for plate diameter 0.804

K₇₆₂(modulus of subgrade reaction) 16.7 kN/m²/mm

CBR Value 1.3 %

Checked/Approved	Date
	08/05/12

CLITHEROE.

Contract No.
PSL12/1735

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test: 04-May-12

Test Position: CBR 3

Depth (m): 0.35

Plate Area (m2): 0.2827433

Type of Kentledge: Wheeled

Moisture Content (%)

26

Maximum Applied Pressure (kPa):

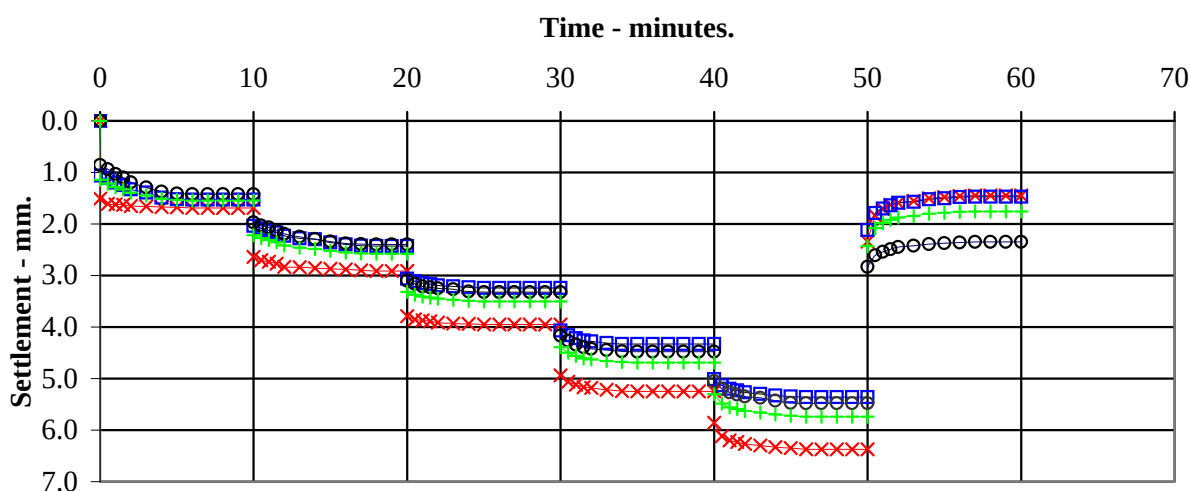
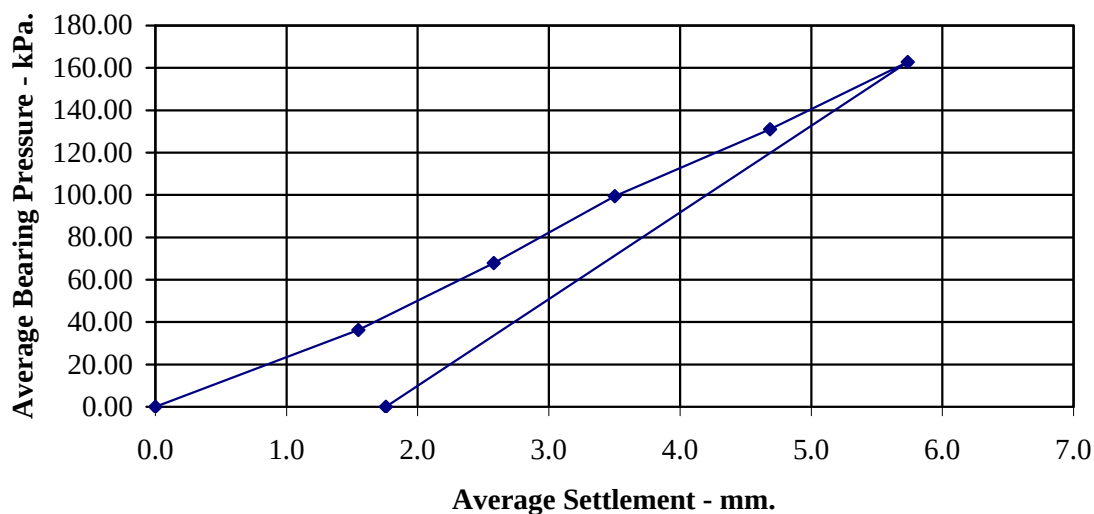
162.71

Maximum Deformation (mm):

5.74

Description:

Brown slightly gravelly sandy CLAY.



—x— Settlement Gauge 1 —□— Settlement Gauge 2 —○— Settlement Gauge 3 —+— Average Settlement

Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	08/05/12		08/05/12		08/05/12	PSL12/1735
CLITHEROE.						Page of

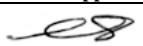
Calculation of Equivalent CBR Value from Plate Bearing Test
Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

Date of Test 4-May-12
Test Position CBR 3
Depth (m) 0.35
Moisture Content(%) 26
Description Brown slightly gravelly sandy CLAY.

Maximum Deflection 5.74 mm
Deflection required for CBR value 1.25 mm
Load(@1.25mm) 30.0 kN/m²
Plate diameter 600 mm
Conversion factor for plate diameter 0.804

K₇₆₂(modulus of subgrade reaction) 19.3 kN/m²/mm

CBR Value 1.6 %

Checked/Approved	Date
	08/05/12

CLITHEROE.

Contract No.
PSL12/1735

VERTICAL DEFORMATION TESTS. BS 1377 : Part 9 : 1990.

Date of Test: 04-May-12

Test Position: CBR 4

Depth (m): 0.65

Plate Area (m2): 0.2827433

Type of Kentledge: Wheeled

Moisture Content (%)

13

Maximum Applied Pressure (kPa):

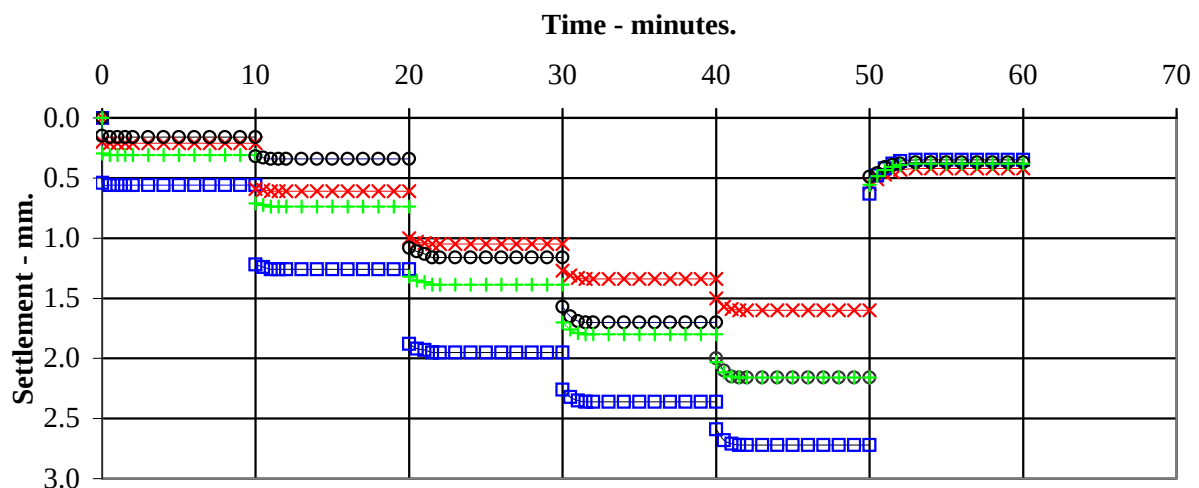
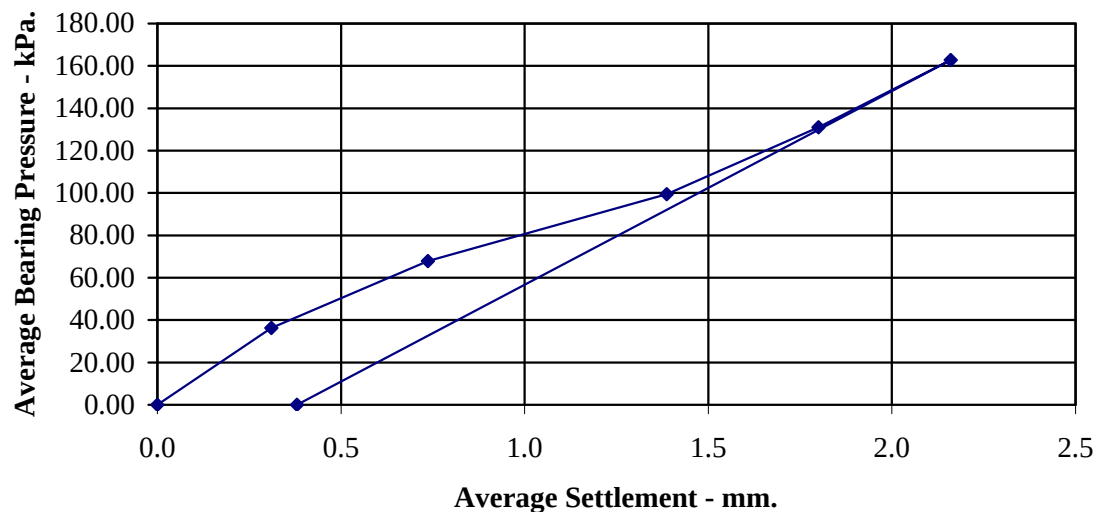
162.71

Maximum Deformation (mm):

2.16

Description:

Brown gravelly slightly sandy CLAY.



—x— Settlement Gauge 1 —□— Settlement Gauge 2 —○— Settlement Gauge 3 —+— Average Settlement

Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	08/05/12		08/05/12		08/05/12	PSL12/1735
CLITHEROE.						Page of

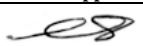
Calculation of Equivalent CBR Value from Plate Bearing Test
Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

Date of Test 4-May-12
Test Position CBR 4
Depth (m) 0.65
Moisture Content(%) 13
Description Brown gravelly slightly sandy CLAY.

Maximum Deflection 2.16 mm
Deflection required for CBR value 1.25 mm
Load(@1.25mm) 93.0 kN/m²
Plate diameter 600 mm
Conversion factor for plate diameter 0.804

K₇₆₂(modulus of subgrade reaction) 59.8 kN/m²/mm

CBR Value 11.6 %

Checked/Approved	Date
	08/05/12

CLITHEROE.

Contract No.
PSL12/1735

VERTICAL DEFORMATION TESTS. BS 1377 : Part 9 : 1990.

Date of Test: 04-May-12

Test Position: CBR 5

Depth (m): 0.35

Plate Area (m²): 0.2827433

Type of Kentledge: Wheeled

Moisture Content (%):

28

Maximum Applied Pressure (kPa):

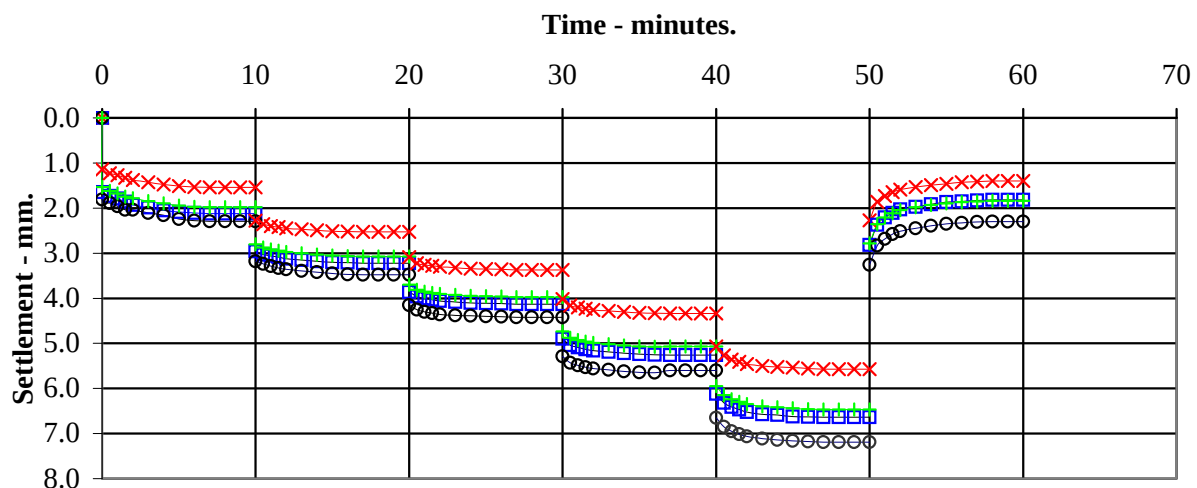
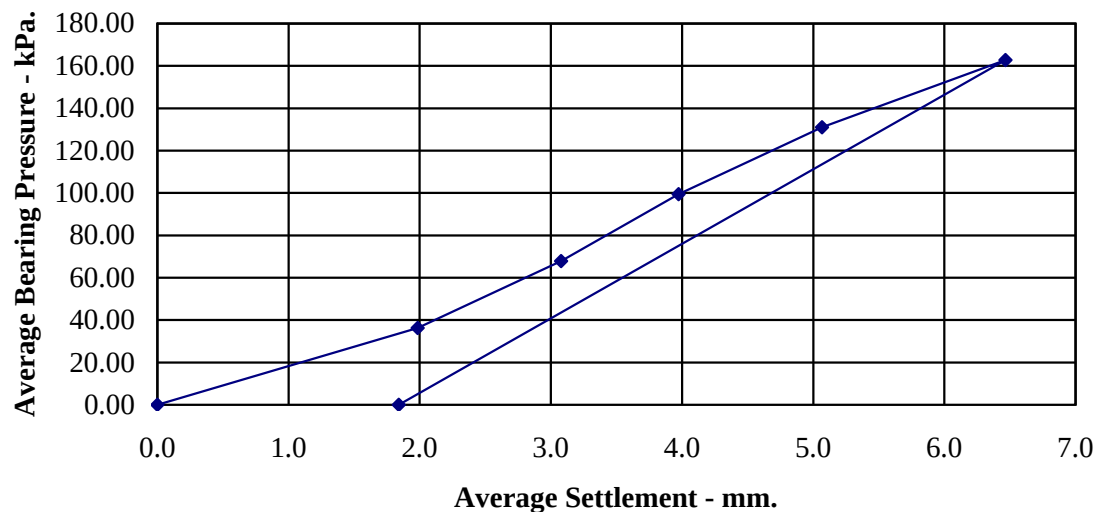
162.71

Maximum Deformation (mm):

6.47

Description:

Brown slightly gravelly sandy CLAY.



—x— Settlement Gauge 1 —□— Settlement Gauge 2 —○— Settlement Gauge 3 —+— Average Settlement

Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	08/05/12		08/05/12		08/05/12	PSL12/1735
CLITHEROE.						Page of

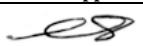
Calculation of Equivalent CBR Value from Plate Bearing Test
Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

Date of Test 4-May-12
Test Position CBR 5
Depth (m) 0.35
Moisture Content(%) 28
Description Brown slightly gravelly sandy CLAY.

Maximum Deflection 6.47 mm
Deflection required for CBR value 1.25 mm
Load(@1.25mm) 24 kN/m²
Plate diameter 600 mm
Conversion factor for plate diameter 0.804

K₇₆₂(modulus of subgrade reaction) 15.4 kN/m²/mm

CBR Value 1.1 %

Checked/Approved	Date
	08/05/12

CLITHEROE.

Contract No.
PSL12/1735

VERTICAL DEFORMATION TESTS.

BS 1377 : Part 9 : 1990.

Date of Test: 04-May-12

Test Position: CBR 6

Depth (m): 0.35

Plate Area (m²): 0.2827433

Type of Kentledge: Wheeled

Moisture Content (%)

33

Maximum Applied Pressure (kPa):

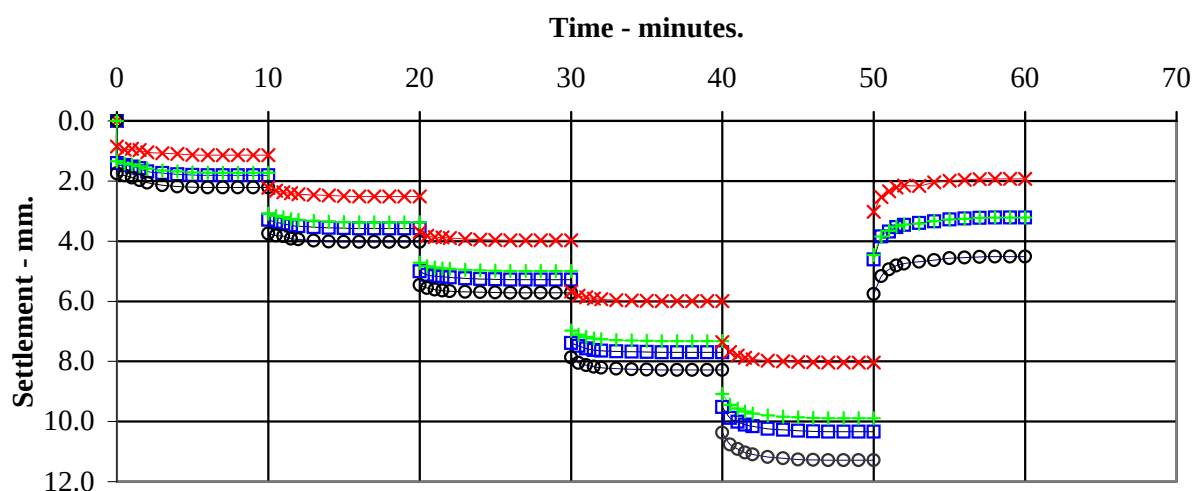
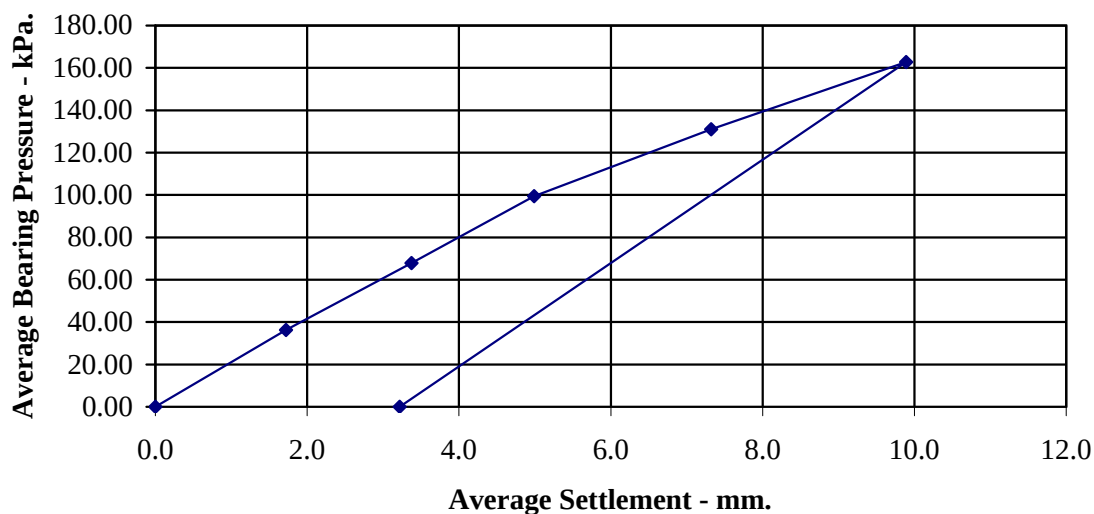
162.71

Maximum Deformation (mm):

9.89

Description:

Brown slightly gravelly
slightly sandy CLAY.



—x— Settlement Gauge 1 —□— Settlement Gauge 2 —○— Settlement Gauge 3 —+— Average Settlement

Compiled By	Date	Checked By	Date	Approved By	Date	Contract No.
	08/05/12		08/05/12		08/05/12	PSL12/1735
CLITHEROE.						Page of

Calculation of Equivalent CBR Value from Plate Bearing Test
Design Manual for Roads and Bridges Volume 7 Section 2 Chapter 4
Incorporating IAN 73/06

Date of Test	4-May-12
Test Position	CBR 6
Depth (m)	0.35
Moisture Content(%)	33
Description	Brown slightly gravelly slightly sandy CLAY.
Maximum Deflection	9.89 mm
Deflection required for CBR value	1.25 mm
Load(@1.25mm)	28.0 kN/m ²
Plate diameter	600 mm
Conversion factor for plate diameter	0.804
K ₇₆₂ (modulus of subgrade reaction)	18.0 kN/m ² /mm
CBR Value	1.4 %

Checked/Approved	Date
	08/05/12

CLITHEROE.

Contract No.
PSL12/1735



LABORATORY REPORT



4043

Contract Number: PSL12/1743

Client's Reference:

Report Date: 11 May 2012

Client Name: Opus
1-2 Aire House
Sidings Court
Richmond Business Park
Doncaster
DN4 5NL

For the attention of: Rob Batterick

Contract Title: Henthorn Lane, Clitheroe

Date Received: 9-May-12
Date Commenced: 9-May-12
Date Completed: 11-May-12

Notes: Observations and Interpretations are outside the UKAS Accreditation

A copy of the Laboratory Schedule of accredited tests as issued by UKAS is attached to this report. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced in full, without the prior written approval of the laboratory.

Checked and Approved Signatories:

R Gunson
(Director)

A Watkins
(Director)


M Beastall
(Laboratory Manager)

SUMMARY OF LABORATORY SOIL DESCRIPTIONS

[illegible]

Professional Soils Laboratory

Compiled by	Date	Checked by	Date	Approved by	Date
	11/05/12		11/05/12		11/05/12
HENTHORNE LANE, CLITHEROE.				Contract No:	PSL12/1743
				Client Ref:	J-D0968

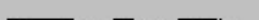
SUMMARY OF SOIL CLASSIFICATION TESTS

(B.S. 1377 : PART 2 : 1990)

[illegible]

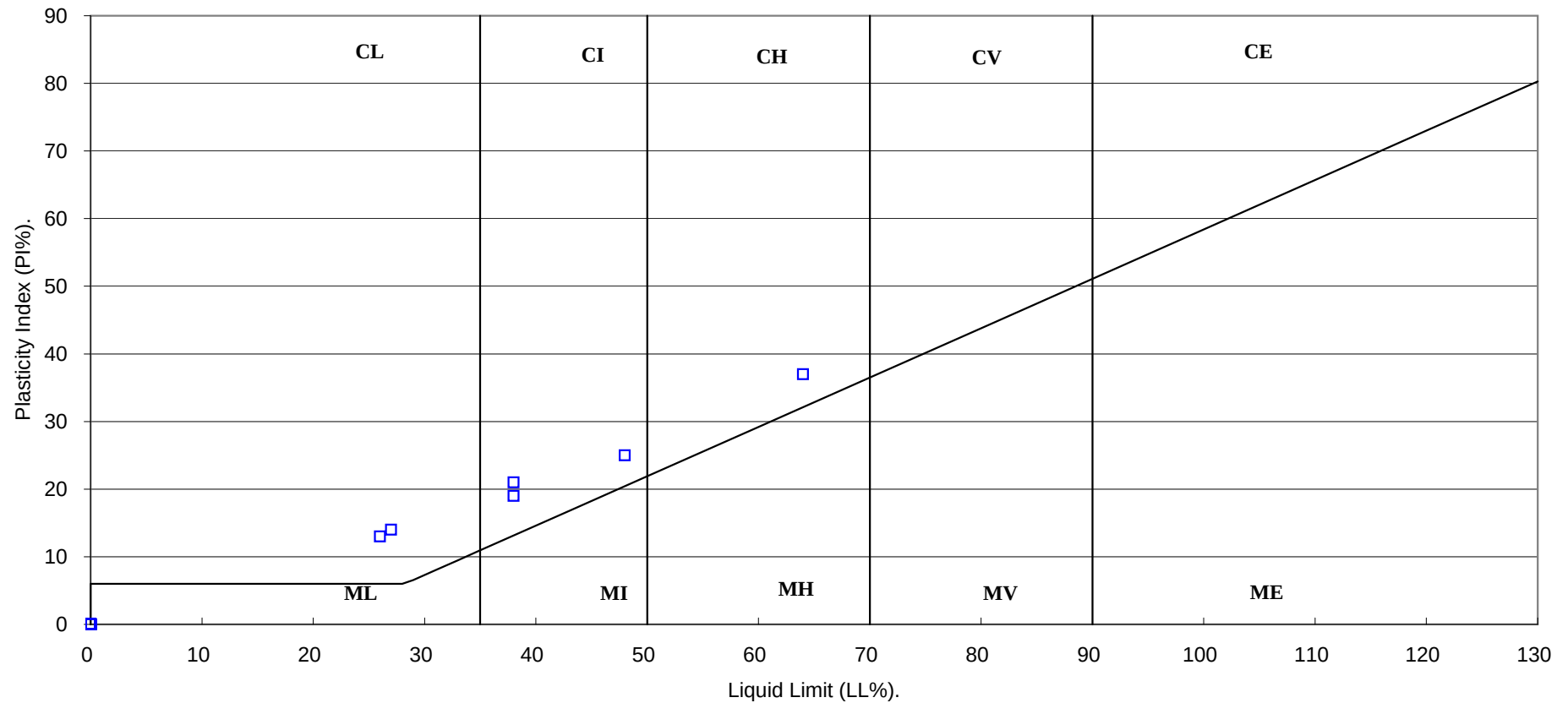
SYMBOLS : NP : Non Plastic

*** : Liquid Limit and Plastic Limit Wet Sieved.**

 Professional Soils Laboratory	Compiled by	Date	Checked by	Date	Approved by	Date
		11/05/12		11/05/12		11/05/12
	HENTHORNE LANE, CLITHEROE.				Contract No:	PSL12/1743
					Client Ref:	J-D0968

PLASTICITY CHART FOR CASAGRANDE CLASSIFICATION.

(B.S.5930 : 1999)



PSL

Professional Soils Laboratory

Compiled by	Date	Checked by	Date	Approved by	Date
<i>[Signature]</i>	11/05/12	<i>[Signature]</i>	11/05/12	<i>[Signature]</i>	11/05/12
HENTHORNE LANE, CLITHEROE.				Contract No:	PSL12/1743
				Client Ref:	J-D0968

APPENDIX D

Gas Monitoring Results



1-2 Aire House
Sidings Court
Richmond Business Park
Doncaster
DN4 5NL

Telephone: 01302 322295
Fax: 01302 322296

Client	Gladman Developments Ltd				
Site	Henthorn Road, Clitheroe				
Title	Gas Monitoring Results				
Job No.	J-D0968	Table No.	1	Sheet No.	1

Drawn	NLH
Checked	DRS
Approved	SLR
Date	28.5.12

	Date:	10.5.12		Pressure (mb):		1025		Pressure Trend:		Rising			
Monitoring Point	Gas Monitor:	GFM 430						Engineer:		Nicola Hughes			
	O ₂	CO ₂		CH ₄ (total)		CH ₄ (% LEL)		H ₂ S	CO	Flow		Water Level	Hole Depth
		Peak	Sustained	Peak	Sustained	Peak	Sustained			Peak	Sustained		
		(% v/v)	(% v/v)	(% v/v)	(% v/v)	(%)	(%)			ppm	ppm		
WS1	20.7	0.1	0.1	0.0	0.0	0.0	0.0	1	1	0.0	0.0	NGW	3.60
WS3	20.6	0.3	0.3	0.0	0.0	0.0	0.0	0	1	0.0	0.0	NGW	3.67
WS4	20.8	0.0	0.0	0.0	0.0	0.0	0.0	2	0	0.8	0.0	0.71	2.73
WS5	20.8	0.1	0.1	0.0	0.0	0.0	0.0	1	0	0.0	0.0	1.02	1.44
WS6	20.8	0.0	0.0	0.0	0.0	0.0	0.0	1	0	-0.2	0.0	0.23	3.69

Key

- NA indicates that data was unavailable/no measurement was taken
- ND indicates that parameter was not detected
- NGW indicates no ground water encountered
- uw indicates that monitoring point was under water
- >>> indicates that parameter was above upper limit of detection

- TBI indicates well was still to be installed
- WL indicates that the well was lost/could no longer be found

Notes



1-2 Aire House
Sidings Court
Richmond Business Park
Doncaster
DN4 5NL

Telephone: 01302 322295
Fax: 01302 322296

Client	Gladman Developments Ltd				
Site	Henthorn Road, Clitheroe				
Title	Gas Monitoring Results				
Job No.	J-D0968	Table No.	1	Sheet No.	1

Drawn	NLH
Checked	SLR
Approved	SLR
Date	28.5.12

	Date:	18.05.12		Pressure (mb):		1000		Pressure Trend:		Falling			
Monitoring Point	Gas Monitor:	GFM 430						Engineer:		RGB			
	O ₂	CO ₂		CH ₄ (total)		CH ₄ (% LEL)		H ₂ S	CO	Flow		Water Level	Hole Depth
		Peak	Sustained	Peak	Sustained	Peak	Sustained			Peak	Sustained		
		(% v/v)	(% v/v)	(% v/v)	(% v/v)	(%)	(%)			ppm	ppm		
WS1	20.5	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0.1	0.0	NGW	3.58
WS3	20.5	0.2	0.2	0.0	0.0	0.0	0.0	0	0	0.0	0.0	3.23	3.65
WS4	20.5	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0.0	0.0	0.71	2.72
WS5	20.5	0.3	0.3	0.0	0.0	0.0	0.0	0	0	0.0	0.0	0.90	1.43
WS6	20.6	0.0	0.0	0.0	0.0	0.0	0.0	0	0	0.0	0.0	0.68	3.67

Key

- NA indicates that data was unavailable/no measurement was taken
- ND indicates that parameter was not detected
- NGW indicates no ground water encountered
- uw indicates that monitoring point was under water
- >>> indicates that parameter was above upper limit of detection

- TBI indicates well was still to be installed
- WL indicates that the well was lost/could no longer be found

Notes



1-2 Aire House
Sidings Court
Richmond Business Park
Doncaster
DN4 5NL

Telephone: 01302 322295
Fax: 01302 322296

Client	Gladman Developments Ltd				
Site	Henthorn Road, Clitheroe				
Title	Gas Monitoring Results				
Job No.	J-D0968	Table No.	1	Sheet No.	1

Drawn	RB
Checked	SLR
Approved	SLR
Date	28.5.12

	Date:	24.05.12		Pressure (mb):		1023		Pressure Trend:		Rising			
Monitoring Point	Gas Monitor:	GFM 430						Engineer:		RB			
	O ₂	CO ₂		CH ₄ (total)		CH ₄ (% LEL)		H ₂ S	CO	Flow		Water Level	Hole Depth
		Peak	Sustained	Peak	Sustained	Peak	Sustained			Peak	Sustained		
		(% v/v)	(% v/v)	(% v/v)	(% v/v)	(%)	(%)			ppm	ppm		
WS1	20.9	0.1	0.1	0.0	0.0	0.0	0.0	0	0	0.0	0.0	NGW	3.60
WS3	20.1	0.9	0.9	0.0	0.0	0.0	0.0	0	0	0.0	0.0	2.94	3.68
WS4	20.9	0.1	0.1	0.0	0.0	0.0	0.0	0	0	0.0	0.0	0.68	2.74
WS5	20.7	0.4	0.4	0.0	0.0	0.0	0.0	0	0	0.0	0.0	1.02	1.50
WS6	20.9	0.1	0.1	0.0	0.0	0.0	0.0	0	0	0.0	0.0	0.96	3.68

Key

NA	indicates that data was unavailable/no measurement was taken
ND	indicates that parameter was not detected
NGW	indicates no ground water encountered
uw	indicates that monitoring point was under water
>>>	indicates that parameter was above upper limit of detection
TBI	indicates well was still to be installed
WL	indicates that the well was lost/could no longer be found

Notes



(i) Notes on Limitations

This report does not consider archaeological, ecological impacts (e.g. bats) or botanical risks (e.g. Japanese knotweed). It is recommended that these are considered as part of the assessment of development constraints for the site.

The assessment and judgements given in this report are directed by both the finite data on which they are based and the proposed works to which they are addressed. The data essentially comprised a study of available documented information from various sources (including Client Furnished reports) together with discussions with relevant authorities and other interested parties. There may also be circumstances at the site that are not documented. The information reviewed is not exhaustive and has been accepted in good faith as providing representative and true data pertaining to site conditions. If additional information becomes available which might impact our environmental conclusions, we request the opportunity to review the information, reassess the potential concerns and modify our opinion if warranted.

It should be noted that any risks identified in this report are perceived risks based on the available information. Actual risks can only be assessed following a physical investigation of the site.

The site investigation has been carried out to provide information concerning the type and degree of contamination, and ground and groundwater conditions to allow a reasonable risk assessment to be made. Betts Geo Environmental Ltd undertake to exercise all reasonable skill, care and due diligence in the exercise of the investigation with respect to sampling techniques, sample storage and report interpretation.

The assessments and judgement given in this report are directed by both the finite data on which they are based and the proposed works to which they are addressed. Data acquisition is subject to the limitations of the methods of investigation used. Exploratory holes undertaken during fieldwork investigate small a small volume of ground in relation to the size of the site and as such can only provide an indication of site conditions. There may be conditions pertaining to the site and the proposed development i.e. localised "hotspots" of contamination, which have not been disclosed by the investigations.

The findings and opinions are relevant to the dates of our site works and should not be relied upon to represent conditions at substantially later dates. Conditions at the site will change over time due to natural variations and anthropogenic activities. Groundwater, surface water and soil gas conditions should be anticipated to change with diurnal, seasonal and meteorological variations.

The opinions expressed in this report regarding any contamination are based on simple statistical analysis and comparison with available guidance values. No liability can be accepted for the retrospective effects of any changes or amendments to these values.

This report was prepared by Betts Geo Environmental Ltd for the sole and exclusive use of Taylor Wimpey in response to particular instructions. Any other parties using the information contained in this report do so at their own risk and any duty of care to those parties is excluded.

This document has been prepared for the titled project only and should any third party wish to use or rely upon the contents of the report, written approval from Betts Geo Environmental Ltd must be sought.

Betts Geo Environmental Ltd accepts no responsibility or liability for the consequences of this document being used for the purpose other than that for which it was commissioned and For this document to any other party other than the person by whom it was commissioned.